RESOLUTION NO. 2015 – 04

BOARD OF DIRECTORS, PENINSULA CORRIDOR JOINT POWERS BOARD
STATE OF CALIFORNIA

***

ADOPTING CEQA FINDINGS OF FACT, STATEMENT OF OVERRIDING CONSIDERATIONS AND MITIGATION MONITORING AND REPORTING PLAN AND APPROVAL OF THE PENINSULA CORRIDOR ELECTRIFICATION PROJECT

WHEREAS, pursuant to Resolution No. 2015-03, the Peninsula Corridor Joint Powers Board (JPB) has certified, in conformance with the California Environmental Quality Act (CEQA), the Final Environmental Impact Report (FEIR) for the Peninsula Corridor Electrification Project (Project) and hereby incorporates by reference the defined terms and statements contained in that Resolution.

NOW THEREFORE BE IT RESOLVED, that the Board of Directors of the Peninsula Corridor Joint Powers Board hereby takes the following actions:

1. The JPB Board has reviewed and considered the information contained in the FEIR and in the CEQA Findings of Fact attached hereto as Exhibit "A" and supporting documentation. The JPB determines that the CEQA Findings of Fact document identifies the significant environmental impacts and mitigation measures associated with the Project. The JPB further finds that the CEQA Findings of Fact have been completed in compliance with CEQA and the State CEQA Guidelines. The JPB hereby approves and adopts the CEQA Findings of Fact attached hereto as Exhibit "A."

2. The JPB hereby finds that the Statement of Overriding Considerations was completed in accordance with Public Resources Code section 21081 and State CEQA Guidelines Section 15093, subdivision (a), which state that CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve the project. The Statement of Overriding Considerations is included in the Findings of Fact attached hereto as Exhibit "A" and sets forth significant environmental effects that are found to be unavoidable but are acceptable due to the overriding considerations and benefits expected to result from implementing the Project. The JPB hereby approves and adopts the Statement of Overriding Considerations included in the Findings of Fact attached hereto as Exhibit "A."

3. Pursuant to Public Resources Code section 21081.6, and State CEQA Guidelines Section 15091, subdivision (d), the JPB hereby adopts the Mitigation Monitoring and Reporting Program attached hereto as Exhibit "B," which ensures that required mitigation is implemented for the Project.

4. Based on and in consideration of all of the foregoing, the JPB hereby approves the Project as described in more detail in the FEIR (incorporated herein), along with the project design features which have been incorporated into the project and the mitigation measures described in the Findings of Fact attached hereto as Exhibit A and reflected in the Mitigation Monitoring and Reporting Program (MMRP) attached hereto as Exhibit B, and which MMRP shall be a condition of the approved project.

5. By making the findings and taking the actions in this resolution, the Board does not waive its rights regarding application of the Interstate Commerce Commission Termination Act of 1995 (ICCTA) (for the reasons explained in Resolution No. 2015- 3), including the defense that ICCTA and the Surface Transportation Board's jurisdiction preempt CEQA's application to the Project. Regardless of potential jurisdictional pre-emption of CEQA's application to the Project, the mitigation measures included in the MMRP shall be a condition of the approved project.

6. The Board hereby directs staff to file a CEQA Notice of Determination with the State Clearinghouse and appropriate County Clerks and to take any other necessary steps to obtain all additional permits, approvals and rights that would allow construction and operation of the Project.

Regularly passed and adopted this 8th day of January, 2015 by the following vote:

AYES: CISNEROS, GEE, GUILBAULT, NOLAN WOODWARD, YEAGER, TISSIER

NOES: NONE

ABSENT: COHEN, KALRA

Chair, Peninsula Corridor Joint Powers Board

ATTEST:

JPB Secretary

FINDINGS OF FACT AND STATEMENT OF OVERRIDING CONSIDERATIONS

PENINSULA CORRIDOR ELECTRIFICATION PROJECT

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ICF International. 2015. Findings of Fact and Statement of Overriding Considerations for the Peninsula Corridor Electrification Project. January. (ICF 00359.14.). Prepared for the Peninsula Corridor Joint Powers Board.

Introduction

Introduction

The Peninsula Corridor Joint Powers Board (JPB) has certified a Final EIR for the Caltrain Peninsula Corridor Electrification Project (Proposed Project or PCEP[1]). The JPB decided to prepare the new EIR for the corridor electrification due to the changes in existing conditions[2] that have occurred along the corridor since prior EIR analyses were conducted, to update the environmental analysis, and to update the cumulative analysis of Blended Service and other developments along the corridor that affect the cumulative scenario. The EIR also allowed public agencies, stakeholders, the public and decision-makers the opportunity to review and comment on the PCEP's environmental effects in light of current information and analyses.

The PCEP will modernize Caltrain service and includes the following basic components. Corridor electrification is the only component that is being environmentally cleared with the FEIR, as explained below. For a detailed description of the PCEP, see Chapter 2, *Project Description*, of the FEIR.

Corridor Electrification: The PCEP will install facility improvements, including overhead catenary wires, support poles, traction power facilities, and other appurtenances necessary to convert service from the existing diesel-locomotive driven trains to Electric Multiple Units (EMUs). EMUs are self-propelled electric trains that do not have a separate locomotive. EMUs can accelerate and decelerate at faster rates than diesel-powered trains, even with longer trains. With EMUs, Caltrain could run longer trains without degrading speeds, thus increasing peak-period capacity. This will provide for operation of up to 6 Caltrain trains per peak hour per direction (an increase from 5 trains per peak hour per direction at present). Electrification of the rail line is scheduled to be operational by 2020/2021[3]. The PCEP includes operating 114 trains per day between San Jose and San Francisco and six trains per day between Gilroy and San Jose. Future proposed actions to expand service beyond 114 trains per day may require additional environmental review.

The PCEP would include the installation of 130 to 140 single-track miles of overhead contact system (OCS) for the distribution of electrical power to the new electric rolling stock. The OCS would be powered from a 25 kilovolt (kV), 60 Hertz (Hz), single-phase, alternating current (AC) traction power

[1] Capitalized terms in this document have the same meaning as in the FEIR.

[2] For example, there have been changes in existing development adjacent to the Caltrain right of way and stations, in levels of traffic, and in adopted land use plans around stations.

[3] The first year of project operation would be 2020/2021 depending on the timing of construction completion. For the sake of simplicity and in recognition that the first year of operations could be in 2020, this document refers to the operational year as 2020.

system consisting of two traction power substations (TPSs), one switching station and seven paralleling stations.

The Proposed Project can be analyzed as a separate project under the California Environmental Quality Act (CEQA) because it has independent utility (providing Caltrain electrified service – see Section 1.5.1.2 of the FEIR) and logical termini (station end points). The PCEP is not dependent upon either of the other components (CBOSS PTC or Blended Service) for operation.

- **Advanced Signal System (commonly referred to as CBOSS PTC or CBOSS):** This component will increase the operating performance of the current signal system, improve the efficiency of at-grade crossing warning functions, and automatically stop a train when there is violation of safe operating parameters. This component, which includes implementation of safety improvements mandated by federal law and a new fiber optic backbone, has been previously approved and is currently being installed. It is scheduled to be operational by 2015 as mandated by the Federal Railroad Administration (FRA).
- **Blended Service:** The JPB, California High Speed Rail Authority (CHSRA), and the Memorandum of Agreement (MOU) partners have agreed on shared use of the Caltrain corridor for the use of up to six Caltrain trains per peak hour per direction and up to four high-speed rail (HSR) trains per peak hour per direction.[4] The operational feasibility of Blended Service has been studied but is presently only at the conceptual planning phase. The potential addition of HSR service to this corridor will be the subject of a separate environmental review process that will be undertaken by CHSRA as the lead agency subsequent to the environmental process for the PCEP. Based on the current *2014 Business Plan* (CHSRA 2014), Blended Service along the Corridor is scheduled to commence sometime between 2026 and 2029. Blended Service would connect with the Downtown Extension (DTX) near the Fourth and King Station in San Francisco, providing Caltrain and HSR service to downtown San Francisco at the Transbay Terminal Center (TTC).

Section 1 of this document provides a summary of the environmental review process. Section 2 describes the alternatives considered in the 2014 FEIR. Section 3 contains the JPB's findings for each significant environmental effect of the Project identified in the FEIR, as required by CEQA. Section 3 also describes the reasons why the project alternatives ultimately have been rejected. Section 4 consists of a statement of overriding considerations, as required by State CEQA Guidelines Section 15093, stating the specific circumstances that support the JPB's determination that the unavoidable significant environmental effects of the PCEP are acceptable because specific benefits of the PCEP outweigh those effects.

CEQA Process

The JPB analyzed the PCEP on the basis of the California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (14 CCR 15000, et seq.). The FEIR prepared by the JPB determined that the PCEP could have potentially significant effects on the environment, including significant effects that cannot be avoided.

[4] The CHSRA 2014 Business Plan (CHSRA 2014) presumes Phase 1 Blended Service would have up to four trains per peak hour and up to four trains per off-peak hour. As explained in Chapter 4, Section 4.1 *Cumulative Impacts*, of the EIR, the EIR presumes up to 40 to 53 daily round-trip high-speed trains in 2040 based on the CHSRA 2012 Business Plan, *Estimating High-Speed Train Operating and Maintenance Cost for the CHSRA 2012 Business Plan* (CHSRA 2012c), which presumed 40 HSR daily round-trips per day and, the Draft 2014 Business Plan *Service Planning Methodology* document (CHSRA 2014) which includes an assumption of 53 daily round trip trains starting in 2029 and continuing beyond 2040. The 2014 Business Plan does not make an explicit statement about the level of service on the Caltrain corridor. Thus, the exact amount of daily HSR service is unknown. The later CHSRA project-level environmental evaluation will address proposed high-speed train service levels along the San Francisco Peninsula.

Consistent with CEQA's requirements, the Draft EIR was circulated for a public comment period beginning on February 28, 2014 and ending on April 29, 2014. All written comments received during the public comment period and during the public meetings held during the public comment period to receive comments on the Draft EIR were responded to in Volume II of the FEIR.

Prior to approving the PCEP, the JPB must certify that it has considered the FEIR, that the FEIR adequately meets the requirements of CEQA, and that the FEIR reflects the independent judgment of the JPB.

Upon approving the PCEP, the JPB must adopt the following findings of fact regarding the significant effects identified in the FEIR, the alternatives identified in the FEIR, and statement of overriding considerations explaining the benefits that outweigh the significant unavoidable effects identified in the FEIR.

Pursuant to Public Resources Code (PRC) Section 21081.6, the JPB is also adopting a mitigation monitoring and reporting program (MMRP) for the mitigation measures that are the JPB's responsibility to implement. The MMRP establishes a program to ensure that the adopted mitigation measures identified in the FEIR will be implemented.

Alternatives Considered

Introduction

The JPB conducted a comprehensive alternative identification and screening process to identify which alternatives to analyze in the PCEP EIR. During the scoping process, the JPB solicited input from the public, agencies, and stakeholders about potential alternatives for consideration. The JPB also reviewed the impacts of the Proposed Project and identified several additional potential alternatives for consideration as well. As discussed in Section 5.4, Alternative Screening Process in the FEIR, the JPB initially considered a wide range of 52 alternatives to the project (other than the No Project Alternative) and then conducted a three-part screening evaluation to select the potentially feasible alternatives to be analyzed in the EIR. Forty-one alternatives were determined to be technically, logistically or financially infeasible, to not avoid or substantially reduce one or more significant impacts of the Proposed Project, or to not meet all or most of the project's purpose and need and were dismissed from further analysis. Of the remaining eleven (11) alternatives, seven (7) were incorporated into the project or mitigation, leaving four (4) action alternatives.

The FEIR examined five alternatives to the PCEP: the No Project Alternative, a Diesel Multiple Unit (DMU) Alternative, a Dual-Mode Multiple Unit Alternative, a Tier 4 Diesel Locomotive Alternative, and an Electrification with Overhead Contact System (OCS) Installation by Factory Train Alternative. Each of these alternatives is ultimately rejected as infeasible[5] for the reasons described in Section 3 below.

No-Project Alternative

State CEQA Guidelines Section 15126.6(e)(2) states that the "no project analysis shall discuss the existing conditions at the time the notice of preparation is published as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services."

Under the No-Project Alternative, there would be no electrification of the Caltrain right of way between San Jose and San Francisco, no purchase of EMUs, and no increase in train service. The current train service is assumed to continue unchanged to 2020 and 2040. This service consists of five trains per peak hour, 92 trains per day, through use of diesel engine–hauled locomotive trains. Locomotives and passenger carriages would be replaced when they reach the end of their service life, meaning that approximately 75 percent of the existing fleet would be replaced by 2020. As new equipment is purchased, the new locomotives would meet the U.S. Environmental Protection Agency (USEPA) Tier 4 emissions standards.

[5] See section below on "Findings Regarding the Alternatives" for discussion of the definition of "infeasible" used in these findings.

While this alternative would not increase the frequency of train service, ridership would still be expected to increase, based on the increase in ridership in recent years. This means that trains would have a higher average occupancy in the future than at present.

DMU Alternative

DMUs are self-propelled diesel-mechanical vehicles with engines located below the passenger compartment. The key DMU characteristic related to desired service improvements is the reduction of running times due to faster acceleration than traditional diesel locomotive push-pull service. DMUs require less time to accelerate up to full speed from stations stops and slow areas (compared to existing single-head diesel locomotive trains). This reduces overall travel times, particularly on a corridor featuring frequent stops.

For the purposes of the EIR, this alternative assumed the following:

- An eight-car single-level DMU train, with a capacity of 78 passengers per car (624 passengers per train) was analyzed in order to analyze an alternative that would roughly match the approximate number of seats ridership per train capacity of the PCEP. Only a single-level DMU is being evaluated because the currently available double-deck DMU designs would not fit through the Caltrain system tunnels and because there are a number of other constraints to a double-deck design including that there is no existing market for double-deck DMUs.
- The Caltrain service schedule for the DMU Alternative would be the same as the PCEP, although ridership would likely be less due to inferior performance. DMUs do not accelerate or decelerate as fast as EMUs and thus the number of station stops would likely have to be reduced to maintain the same trip time as the PCEP EMUs. Otherwise, travel times would be unacceptably longer.
- The eight-car single-level DMU train length of 680 feet would exceed the length of Caltrain platforms at most Caltrain stations and would require platform extension construction.
- The DMU Alternative is assumed to terminate at the Fourth and King Station in San Francisco. It would not proceed to the TTC because the DTX tunnel and the TTC are designed only for electric trains. In the long-run, this would also result in less ridership than the Proposed Project.

Dual-Mode Multiple Unit Alternative

Dual-mode MUs are self-propelled vehicles that can operate in both a diesel mode and in an electrified mode. While there are dual-mode locomotives in operation on the East Coast, there are no known dual-mode MUs presently in operation in the United States. However, there are dual-mode MUs in operation in Europe and others under construction that can operate in both a diesel mode in non-electrified territory and in an electrified mode using an overhead 25 kVA OCS.

For the purposes of this alternative analysis, existing European train designs were used to derive alternative assumptions:

- A 10-car single-level dual-mode MU train, consisting of two, coupled, five-car trainsets with an approximate capacity of 600 passenger seats per train was analyzed in order to provide an alternative that would roughly match the per-train capacity of the PCEP.

- The 10-car single-level dual-mode MU train length would be 600 feet which would require lengthening at some of the Caltrain platforms including the platforms at 22nd Street, Broadway, California Street, Sunnyvale, and Santa Clara.
- Caltrain's service schedule for the Dual-Mode MU Alternative would be the same as the PCEP, but likely lower ridership due to inferior performance compared to EMUs. Dual-mode MUs do not accelerate or decelerate as fast as EMUs and thus the number of station stops would likely have to be reduced to maintain the same trip time as the PCEP EMUs. Otherwise, travel times would be unacceptably longer.
- This alternative does not include electrification between San Jose and the Fourth and King Station in San Francisco. However, this alternative would need to include traction power facilities to link the electrified lines in the DTX to power from PG&E. This electrification would involve connecting overhead or underground transmission wires from PG&E to a new traction power substation, and connecting transmission lines from the new traction power substation to the Overhead Contact System (OCS) for the DTX.
- This Alternative is assumed to operate in a diesel mode from San Jose to San Francisco and then either terminate at the San Francisco Fourth and King Station or proceed in an electric mode to the TTC. In 2020, this alternative, like the Proposed Project, would terminate at the Fourth and King Station. In 2040, this alternative is presumed to operate with split service with 4 trains terminating at the Fourth and King Station and two trains proceeding to TTC.

Tier 4 Diesel Locomotive (T4DL) Alternative

This alternative would substitute Tier 4 diesel locomotives for EMUs. This alternative includes two variants: 1) a single-head (SH) scenario where the train is operated with only one locomotive; and 2) a double-head (DH) scenario in which trains are operated with two locomotives in order to match the PCEP schedule.[6]

The following assumptions were made for this alternative in the EIR:

- The train would be the same as today with a single or double locomotive hauling 5 bi-level passenger coaches with a nominal capacity of 600 passenger seats per train order. The alternative would roughly match the ridership per train capacity of the PCEP.
- It was assumed that the Caltrain service levels (6 trains per peak hour, 114 trains/weekday) would be the same as the PCEP.
- For 2040, the T4DL Alternative is assumed to terminate at the San Francisco Fourth and King Station and would not proceed to the TTC because the DTX and the TTC are designed only for electric trains.

[6] In order to provide an "apples to apples" comparison, the Tier 4 Diesel Locomotive Alternative presumes replacement of approximately 75 percent of the existing diesel locomotives in 2020 with Tier 4 diesel locomotives and the use of the other remnant Caltrain diesel locomotives until they reach the end of their service life, which is the same assumption made about the use of EMUs for the PCEP.

Electrification with OCS Installation by Factory Train Alternative

This alternative consists of the same operational elements as the PCEP (i.e., electrified service with EMUs), but with a different method for construction of the OCS. The alternative method of installing the OCS would be through the use of a so-called "Factory Train" (also called an "Electrification Train" and a "High Output Plant System" or the HOPS train), which is a moveable assembly line system, mounted on rails. One of the prime advantages of a Factory Train is the faster rate of progress in OCS installation compared to the PCEP. Rates of progress up to one (1) mile/night have been reported, and the system can reportedly be used while allowing for adjacent rail lines to be used by existing trains although there may be speed restrictions for the use of adjacent lines.

This is a construction methodology alternative to conventional construction of the OCS. Thus, analysis in the EIR is limited to differences between the PCEP and this alternative relative to OCS construction. Under this alternative, about 80 percent of the OCS is presumed to be installed using a Factory Train with the remaining 20 percent assumed to be installed using conventional construction.

Findings

CEQA Requirements

CEQA requires the lead agency to make written findings about the disposition of the project's effects whenever it decides to approve a project for which an EIR has been certified (PRC Section 21081). Regarding these findings, Section 15091 of the State CEQA Guidelines states, in part:

(a) No public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. The possible findings are:

(1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.
(2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
(3) Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

(b) The findings required by subsection (a) shall be supported by substantial evidence in the record.

The "changes or alterations" referred to in the State CEQA Guidelines may be mitigation measures, alternatives to the project, or changes to the project by the project proponent. The FEIR for the PCEP identifies mitigation measures that will reduce significant effects of the PCEP or mitigate other potential effects that may not be, strictly speaking, environmental effects under CEQA. These mitigation measures will be incorporated into the design of the Project. An MMRP will also be adopted by the JPB to ensure that the mitigation measures identified in the FEIR and these findings will be implemented.

The documents and other materials that constitute the record upon which the JPB's decision and these findings are based can be reviewed in person at the following location:

Peninsula Corridor Joint Powers Board
1250 San Carlos Avenue
San Carlos, CA 94070
Contact: Stacy Cocke

Findings Regarding Independent Review and Judgment

Each member of the JPB was provided a complete copy of the FEIR for the PCEP in advance of the hearing on the project. The JPB hereby finds that the FEIR reflects its independent judgment. The JPB also finds that it has independently reviewed and analyzed the FEIR prior to taking final action with respect to the PCEP.

Findings Regarding the PCEP

Findings Regarding Significant and Unavoidable Effects

The JPB determines that the following significant effects cannot be avoided. Feasible mitigation measures included in the FEIR will lessen the effects, but will not result in complete mitigation of the effects to a less-than-significant level. The following identifies the pertinent mitigation measures by number and summary title. The full text of each of the mitigation measures cited below is found in the FEIR and that text is hereby incorporated by reference.

Note that the next section identifies those effects for which mitigation measures have been adopted and that are thereby reduced below the level of significance. The titles/numbers of the effects are the same as those in the FEIR.

Aesthetics

Significant Effect: AES-2 - Substantially degrade the existing visual character or quality of the site and its surroundings (certain operations).

Findings: The JPB hereby makes findings (a)1 and (a)(3) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The PCEP would change local visual character through addition of the OCS, TPFs and tree removal along the existing Caltrain right of way. The effect of the OCS and the TPFs can be mitigated to a less-than-significant level with the measures identified in the FEIR as discussed in the discussion below on *Findings Regarding Significant Effects Mitigated to a less than Significant Level*.

However, the change in aesthetics resulting from the tree removal necessary to operations is considered a significant and unavoidable impact. The following measures mitigate this impact to the extent feasible, but not to a less than significant level.

- AES-2b: Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers.
- BIO-5: Tree Avoidance, Minimization, and Replacement Plan.
- CUL-1d: Implement design commitments at historic railroad station.

While Mitigation Measure BIO-5 would require the use of alternative pole designs (such as center poles, two-track cantilevers, side poles with offset insulators, and portals) to reduce the removal and pruning of trees where consistent with construction, maintenance, operations and safety concerns, in some locations along the project corridor there is insufficient ROW width or track spacing to both place electrification infrastructure and completely avoid tree removal. For example, center poles can only be used when there is adequate spacing between tracks to allow for adequate separation of the electrified lines, which does not exist in all areas. Even with alternative designs, there will remain a need to provide for electrical safety of the electrified overhead wires from contact with vegetation. Where trees must be removed, Mitigation Measure BIO-5 requires them to be replanted within areas to help offset the aesthetic effects of the tree removal. But in some locations, trees may not be able to be replanted directly in the same line of sight as trees removed, which could change localized visual character. Thus, adopted mitigation would reduce this impact as much as possible, but is not guaranteed to avoid localized significant effects to visual character.

Four of the five alternatives analyzed in the FEIR would avoid tree removal impacts of the Proposed Project because they do not include electrical infrastructure between San Jose and San Francisco (the fifth alternative involving the installation of the OCS using a factory train would not). The reasons for rejecting the four alternatives analyzed in the FEIR are presented later in the section below *Findings Regarding the Alternatives*. Other alternatives that would avoid this impact, such as third-rail technology, were also considered and screened out of the range of potentially feasible alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

Significant Effect: CUMUL-1-AES – Cumulative impacts on visual aesthetics (operations).

Findings: The JPB hereby makes findings (a)1 and (a)(3) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Blended service with more than two high-speed trains would require a set of passing tracks. Depending on location, this may result in a significant change in local visual character in combination with the PCEP's impacts related to tree removal and OCS installation. Because the PCEP would result in changes in visual character at some locations due to tree removal where tree replacement is not possible on-site, the PCEP may contribute considerably to localized changes in visual character along with blended service passing tracks.

The following measures mitigate the PCEP's contribution to this impact, but not to a less than considerable (i.e., less than significant) level.

- AES-2b: Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers.
- BIO-5: Tree Avoidance, Minimization, and Replacement Plan.
- CUL-1d: Implement design commitments at historic railroad station.
- AES-4b: Minimize light spillover at TPFs.

There is no feasible alternative that would avoid this impact. See *Findings Regarding the Alternatives* for an explanation of why none of the five alternatives analyzed in the FEIR were adopted. Other alternatives that would avoid this impact, such as third-rail technology, were considered and screened out of the range of alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

Cultural Resources

Significant Effect: CUL-1 - Cause a substantial adverse change in the significance of historic built resources pursuant to Section 15064.5 (certain locations)

Findings: The JPB hereby makes findings (a)(1) and (a)(3) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Construction of the Proposed Project's OCS has the potential to affect certain historic resources, specifically the Caltrain San Francisco Railroad Tunnels 1 through 4, historic Caltrain stations, certain bridges and underpasses, and several other potential historic resources. Required mitigation measures would avoid significant effects on historical resources, with the exception of Railroad Tunnel 4 in San Francisco. Tunnel 4 modifications necessary to provide sufficient height clearances for Caltrain and freight rail cars, particularly the removal of the decorative stone portal, may result in significant and unavoidable impacts.

To create safety clearance for the OCS, trees would be potentially pruned or removed from potentially historic residential properties at 45 and 51 Mount Vernon Lane in Atherton. Because these two properties are 50 years old or more and were not visually accessible, for the purpose of this Project they are assumed to be historic resources eligible for listing due to their architectural significance. At this time, it is unknown whether the properties are historic resources, whether the PCEP would have a significant impact on their historic character due to tree removal and whether Mitigation Measure CUL-1e would avoid significant impacts. Therefore, it is presumed that this impact is potentially significant and unavoidable.

The following measures mitigate this impact, but not to a less than significant level.

- CUL-1a: Evaluate and minimize impacts on structural integrity of historic tunnels
- CUL-1b: Minimize impacts on historic decorative tunnel material
- CUL-1c: Install project facilities in a way that minimizes impacts on historic tunnel interiors
- CUL-1d: Implement design commitments at historic railroad stations.
- CUL-1e: Implement specific tree mitigation considerations at two potentially historic properties and landscape recordation, as necessary.
- CUL-1f: Implement historic bridge and underpass design requirements.
- BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan.

At San Francisco Tunnel 4 a combination of tunnel notching and track lowering is proposed to provide necessary vertical clearances. Due to track alignment issues north and south of the tunnel, it is not feasible to lower the track sufficiently to avoid the need for notching. Mitigation Measure CUL-1b would lower the impact on the decorative tunnel portal but may not be able to fully avoid visual alteration of the portal decorative material.

Mitigation Measure BIO-5 would require the use of alternative poles to minimize tree removal including on the two potentially historic residential properties. A preliminary analysis conducted for the FEIR for Atherton showed that the use of center poles, if ultimately feasible, could avoid encroachment on private properties in Atherton including the two potentially historic residential properties, in which case this significant impact could be avoided. However, this cannot be determined until final design.

Four of the five alternatives analyzed in the FEIR would avoid tree removal impacts to the two potentially historic residential properties and tunnel modification to San Francisco Tunnel 4 because they do not include electrical infrastructure between San Jose and San Francisco (the fifth alternative involving the installation of the OCS using a factory train would not). The reasons for rejecting the four alternatives analyzed in the FEIR are presented later in the section below *Findings Regarding the Alternatives*. Other alternatives were considered and screened out of the range of potentially feasible alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

Hydrology and Water Quality

Effect: HYD-7 - Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of sea level rise.

Findings: The JPB hereby makes findings (a)(1), (a)(2) and (a)(3) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings:
Sea level rise (SLR) is a concern for the future, particularly in combination with future storm events and coastal flooding. A scenario with 100-year flood flows coincident with high tides taking into account SLR over a 50-year or 100-year horizon would dramatically increase the risk of flooding in the vicinity of the project area. The PCEP, the tracks, and associated facilities, are minimal in size relative to their surrounding areas and would not divert or increase flood risks relative to other adjacent areas associated with these events.

However, future SLR may result in worsened coastal flooding events that could affect new project facilities (i.e., traction power substations, switching station, and paralleling stations), existing facilities (tracks and stations), and service and riders on Caltrain. The concern is the impact of SLR on the PCEP (and existing facilities) as opposed to the impact of the PCEP on SLR (the project would help to reduce GHG emissions which would help to reduce the potential amount of SLR in combination with other global efforts to reduce such emissions). Given recent court rulings (including *Ballona Wetlands*) and the pending review of this issue by the California Supreme Court, it is uncertain whether analysis of such "impacts of the environment on the project" are or are not required by CEQA. Caltrain is providing this analysis as if such analysis is required under CEQA as a conservative approach and for the purpose of full public disclosure.

The PCEP would not change the potential localized impacts of flooding associated with SLR when they would occur. However, the PCEP would introduce electrical infrastructure at risk of flooding impact and electrical safety risks associated with water contact. The OCS wires and energized elements would be at least 15 feet above the ground surface and, thus, would not be at risk of flooding, even with projected SLR ranges in the higher part of the range for 2100 (+ 5.5 feet). However, the TPFs would be at ground surface and thus those TPFs in areas subject to future coastal flooding may be exposed to mid-century (2050) and/or end-of-century (2100) SLR projections.

Portions of the Caltrain right of way and some of the new project facilities are at risk of future coastal flooding due to the projected SLR associated with climate change. Existing trackbed elevations along the alignment were compared to the future state projections of sea level rise elevations for 2050 and 2100(CO-CAT 2013).

The following measures mitigate this impact, but not to a less than significant level.

- HYD-4: Minimize floodplain impacts by minimizing new impervious areas for new TPFs or relocating these facilities
- HYD-5: Provide for electrical safety for all new TPFs subject to periodic or potential flooding
- HYD-7: Implement a sea level rise vulnerability assessment and adaptation plan

Given that effective coastal flooding mitigation requires the involvement of multiple parties beyond Caltrain, at this time it cannot be concluded that future flooding impacts on the Caltrain system would be fully avoided. Potential adaptation solutions could include flood levees, seawalls, elevated tracks, and/or minor track realignment. In most locations, new levees or seawalls would be optimally placed closer to the Bay or along tidal channels rather than directly along the Caltrain alignment given the need to protect other development subject to flooding between the Caltrain alignment and the Bay. At this time, the feasibility of implementing all measures necessary to avoid future inundation associated with 100-year floods influenced by SLR is not known given that assessment of such solutions will be an ongoing, long-term, and multi-agency process.

Four of the five alternatives analyzed in the FEIR would avoid placing new electrical infrastructure of the between San Jose and San Francisco (the fifth alternative involving the installation of the OCS using a factory train would not) which would avoid placing such new facilities at potential risk of future flooding with SLR. The reasons for rejecting the four alternatives analyzed in the FEIR are presented later in the section below *Findings Regarding the Alternatives*. Other alternatives were considered and screened out of the range of potentially feasible alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

Significant Effect: CUMUL-9-HYD - Cumulative impacts related to hydrology and water quality (regarding flooding due to sea level rise).

Finding: The JPB hereby makes findings (a)(1), (a)(2) and (a)(3) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: For future coastal flooding resultant from increased SLR, additional portions of the Caltrain right of way could be affected by flooding. Mitigation Measure HYD-7 requires Caltrain to adopt and implement a sea level rise vulnerability assessment and adaptation plan and work with other local partners to identify and implement adaptation measures to protect people and structures. However, as noted in Section 3.9, *Hydrology and Water Quality*, at this time the feasibility of implementing all measures necessary to avoid future inundation associated with 100-year floods influenced by SLR is not known given that assessment of such solutions will be an ongoing, long-term, and multi-agency process. Consequently, because the PCEP would place additional people and structures in areas that could be affected by coastal flooding influenced by SLR and the determination of definitive mitigation to protect all parts of the Caltrain right of way and facilities is infeasible at this time, the PCEP's contribution to potential cumulative risks of flooding would be considerable.

The following measures mitigate this impact, but not to a less than significant level.

- HYD-4: Minimize floodplain impacts by minimizing new impervious areas for new TPFs or relocating these facilities
- HYD-5: Provide for electrical safety for all new TPFs subject to periodic or potential flooding
- HYD-7: Implement a sea level rise vulnerability assessment and adaptation plan

Given that effective coastal flooding mitigation requires the involvement of multiple parties beyond Caltrain, at this time it cannot be concluded that future flooding impacts on the Caltrain system would be fully avoided. Potential adaptation solutions could include flood levees, seawalls, elevated tracks, and/or minor track realignment. In most locations, new levees or seawalls would be optimally placed closer to the Bay or along tidal channels rather than directly along the Caltrain alignment given the need to protect other development subject to flooding between the Caltrain alignment and the Bay. At this time, the feasibility of implementing all measures necessary to avoid future inundation associated with 100-year floods influenced by SLR is not known given that assessment of such solutions will be an ongoing, long-term, and multi-agency process.

Four of the five alternatives analyzed in the FEIR would avoid placing new electrical infrastructure of the between San Jose and San Francisco (the fifth alternative involving the installation of the OCS using a factory train would not) which would avoid placing such new facilities at potential risk of future flooding with SLR. The reasons for rejecting the four alternatives analyzed in the FEIR are presented later in the section below *Findings Regarding the Alternatives*. Other alternatives were considered and screened out of the range of alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

Noise and Vibration

Significant Effect: NOI-1a - Expose sensitive receptors to substantial increase in noise levels (construction).

Findings: The JPB hereby makes findings (a)(1) and (a)(3) (described in Section 3.1 above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Construction would be required during the day and night in order to maintain Caltrain passenger service during construction. Although the measures specified in Mitigation Measure NOI-1a would generally reduce the construction noise levels, the measures would not necessarily guarantee that all sensitive residential receptors would not be exposed to noise levels exceeding the 80 dBA limit during the day or the 70 dBA limit at night. Specifically, given that construction must work around the operations of this active railroad line, it is probable that construction near some residential areas will have to be conducted at night to avoid disruption of passenger rail operations and to complete the project on schedule. Furthermore, at TPFs, a temporary sound wall may be effective, but in many cases (such as OCS pole installation) the nature of the construction work makes use of such sound walls infeasible.

The following measure mitigates this impact, but not to a less than significant level.

- NOI-1a: Implement Construction Noise Control Plan

Four of the five alternatives analyzed in the FEIR would avoid placing new electrical infrastructure at risk of future flooding with SLR. The fifth alternative involving the installation of the OCS using a factory train would not avoid placing such new facilities at potential risk of future flooding with SLR. The reasons for rejecting the four alternatives analyzed in the FEIR are presented later in the section below *Findings Regarding the Alternatives*. Other alternatives were considered and screened out of the range of alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

Significant Effect: CUMUL-11-NOI - Cumulative increase in noise or vibration (operational noise)

Finding: The JPB hereby makes finding (a)(2) and (a)(3) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Mitigation Measure NOI-1a would require development and implementation of a noise control plan to reduce potential construction noise impacts, but would not necessarily reduce all noise impacts at all times during construction to a less than significant level, particularly with the likelihood of substantial night-time construction expected with the PCEP. Because there will be other projects in construction adjacent to the Caltrain right of way at the same time, the PCEP could result in a cumulatively considerable contribution to cumulative construction noise impacts. Even with mitigation measures identified below, these cumulative impacts could be significant and unavoidable.

Cumulative operational noise impacts were evaluated for both 2020 and 2040 scenarios with the combined effect of the Proposed Project, HSR trains (2040 scenario only), increases in freight service, and increases in other tenant passenger rail services (ACE, Capitol Corridor, AMTRAK, and Dumbarton Rail Corridor). Cumulative noise increases were found to increase noise levels in excess of FTA noise thresholds in 2020 at approximately one quarter of study locations and in 2040 at nearly all study locations if all rail increases come to fruition. With full Caltrain electrification (e.g. all EMUs between San Jose and San Francisco), then the Proposed Project would not contribute to cumulative increases in noise above existing levels. However, with continued operation of 25% remnant diesels, the Proposed Project would contribute to cumulatively significant noise increases above existing levels at a discrete number of locations (three in 2020 and four in 2040), but the amount of Caltrain's contribution is only 8 to 13 percent in 2020 and 3 percent in 2040, respectively.

Cumulative noise mitigation is proposed to consider a long-term program of noise reductions including multiple approaches such as building sound insulation, quiet zones and grade separations. Caltrain is responsible to pay for its fair-share portion of the mitigation for cumulative noise increase due to the Proposed Project per the mitigation in the EIR. Quiet zones may be adopted only by local jurisdictions (i.e., cities and counties), not by rail operators like Caltrain. As discussed in Section 4.1, *Cumulative Impacts*, in the Final EIR, this mitigation strategy would only apply where a local jurisdiction is willing to approve a quiet zone and where feasible at-grade crossing improvements are identified that meet the FRA requirements for quiet zones. Other mitigation options include grade separations and building insulation. As discussed in the FEIR, on its own, it is financially infeasible for Caltrain to implement grade separations as noise mitigation. Given the relatively small percent contribution, on its own the project's fair-share contributions are infeasible to fully mitigate the cumulative impacts to a less than significant level, and the mitigation will require the fair-share participation in costs of the other contributors to cumulative noise increases.

The following measures mitigate this impact, but not to a less than significant level.

- NOI-1a: Implement Construction Noise Control Plan
- NOI-1b: Conduct site-specific acoustical analysis of ancillary facilities based on the final mechanical equipment and site design and implement noise control treatments where required
- NOI-CUMUL-1: Implement a phased program to reduce cumulative train noise along the Caltrain corridor, as necessary to address future cumulative noise increases over FTA thresholds.

As to secondary environmental impacts of Mitigation Measure NOI-CUMUL-1, grade separations may nevertheless have substantial environmental impacts depending on their design and location, and their construction can be highly disruptive. Therefore, as a conservative assumption, their secondary environmental impacts such as traffic delays are assumed to be significant and unavoidable.

None of the five alternatives analyzed in the FEIR would avoid significant cumulative noise impacts. As shown in Table 4-11 in the FEIR, the No Project Alternative would have higher noise levels than the Proposed Project in both 2020 and 2040. The DMU Alternative would also have higher noise levels than the Proposed Project as shown in Table 5-9 and as discussed in Chapter 5, Alternatives in the FEIR. The Dual-Mode MU Alternative would have similar noise levels as the DMU Alternative when in diesel mode. The Tier 4 Diesel Locomotive Alternative would also have higher noise levels than the Proposed Project as shown in Table 5-10 and as discussed in Chapter 5, Alternatives in the FEIR. The Factory Train Alternative would have the same noise levels as the Proposed Project. Thus, all the action alternatives would also require cumulative noise mitigation and result in potentially significant secondary environmental impacts. Other alternatives were considered and screened out of the range of potentially feasible alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

Transportation and Traffic

Significant Effect: TRA-1c - Conflicts or creates inconsistencies with local traffic plans or substantially disrupts future local traffic operations from Proposed Project operation in 2020

Finding: The JPB hereby makes finding (a)(3) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Although the PCEP would reduce regional vehicle miles travelled which will help levels of service on arterials, highways and freeways, and city by city overall vehicle miles travelled (VMT), the PCEP would also affect local traffic operations along the Caltrain corridor in several ways. First, the number of trains would increase, increasing the number of gate down occurrences in comparison to the No Project scenario which would affect traffic at intersections near grade crossings. Second, the increased train service and added train capacity would increase ridership which would result in potential increases in traffic near Caltrain stations from the increased number of riders accessing the stations via vehicles.

The following measures mitigate this impact, but not to a less than significant level.

- TRA-1c: Implement signal optimization and roadway geometry improvements at impacted intersections for the 2020 Project Condition.

As discussed in Section 3.14 in the Final EIR, it is financially infeasible for Caltrain, on its own, to implement grade separations or major roadway reconfigurations to address localized traffic impacts at locations where the EIR mitigation would not reduce project impacts to a less than significant level as there is inadequate funding likely available to Caltrain for the project and inadequate funding available otherwise to Caltrain as a subsidized public railroad. Caltrain will continue to work with local, state, and federal partners in implementing grade separations over time (as it has done in the past) to find funding and to implement separation projects, but this will take many decades to implement and cannot be guaranteed at this time.

The No Project Alternative would have less localized traffic impacts due to lower ridership at the expense of worse conditions on arterials and regional roadways and overall higher VMT. The DMU Alternative, Dual Mode MU Alternative, and the Tier 4 Diesel Locomotive Alternative would likely have somewhat lower ridership due to inferior performance and/or inability to reach the TTC in the long-run which would mean less localized traffic also at the expense of worse conditions on arterial and regional roadways and overall higher VMT. This is a tradeoff of traffic impacts that JPB finds overriding considerations in favor of overall city by city VMT reduction and overall regional VMT reduction. The fifth alternative involving the installation of the OCS using a factory train would not) would have the same traffic impacts as the Proposed Project. The reasons for rejecting the five alternatives analyzed in the FEIR are presented later in the section below *Findings Regarding the Alternatives*. Other alternatives were considered and screened out of the range of alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

Significant Effect: CUMUL-14-TRA - Cumulative effects to transportation and traffic (localized traffic and freight service during operation)

Finding: The JPB hereby makes finding (a)(3) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The Draft EIR studied cumulative impacts with and without the PCEP at a total of 92 intersections along the Caltrain corridor. Of those intersections, there would be 39 locations where the PCEP would contribute considerably to significant localized cumulative traffic impacts. Cumulative mitigation includes signalization a minor roadway improvements. Proposed mitigation would reduce the PCEP's cumulative contribution to less than significant at all but 17 intersections. While grade separations are a technically feasible mitigation, as noted above it is financially infeasible for Caltrain to adopt a comprehensive program of grade separations as mitigation. However, in the long-term where funding becomes available and it is acceptable to local jurisdictions, Caltrain would support grade separations in the long run.

As to roadway major widenings or grade separations, the design and feasibility of such potential future mitigations are unknown and unstudied at this time, and, thus, the specific environmental impacts cannot be identified. Such major improvements will need to have their own environmental review as appropriate, as they can have substantial environmental impacts depending on their design and location and their construction can be highly disruptive and, thus, as a conservative assumption, their secondary environmental impacts are considered significant and unavoidable.

The PCEP could result in potential localized traffic and related noise impacts if freight diversion to trucks occurs. The actual potential for diversion of freight is considered low and the low levels of existing and future freight can likely be accommodated even with the changes in heights due to the PCEP OCS. Even if limited diversion of freight from trains occurs, it is not likely to result in significant secondary regional traffic, air quality or greenhouse gas emissions impacts because of the positive effects of the PCEP.
However, there is the potential for localized noise and traffic effects as a result of diverting some future increases in freight carried by rail to trucks because of changes in the lowered vertical height due to the OCS.

The following measures reduce these contributions, but not to a less than considerable level.

For Localized Traffic Operation

TRA-CUMUL-1: Implement a phased program to provide traffic improvements to reduce traffic delays near at-grade crossings and Caltrain stations

For Freight Service Operation
TRA-CUMUL-3: As warranted, Caltrain and freight operators will partner to provide Plate H clearance as the Lafayette Pedestrian Overpass location

Mitigation Measure TRA-CUMUL-3 would be limited to track lowering at the Lafayette Pedestrian Overpass (MP 43.65) to allow Plate H clearance to be able to access the Butterhouse Spur. The residual cumulative impact would be a future constraint on train equipment to existing freight heights from the Butterhouse Spur to Bayshore to Plate F+ (18.92') instead of the current possible Plate H (20.25') clearance. While it is not likely that freight will be diverted to truck modes due to this change, given that existing Plate H equipment is not used on this portion of the corridor, it is possible there might be a mode shift for some of the future freight growth. As discussed in Section 4, *Other CEQA – Required Analysis* of the FEIR, this would not be a significant regional traffic, air quality or GHG emissions cumulative impact, but might result in some localized noise or traffic impacts, depending on location of truck haul routes, timing, and intensity. This is considered a significant and unavoidable impact, primarily due to the effect on the San Francisquito Bridge. Due to the cost and environmental impact associated with replacement of the San Francisquito Bridge, it is considered infeasible for Caltrain to fully mitigate this minor lowering of vertical clearance heights.

The No Project Alternative would have less localized traffic impacts due to lower ridership at the expense of worse conditions on arterials and regional roadways and overall higher VMT. The DMU Alternative, Dual Mode MU Alternative, and the Tier 4 Diesel Locomotive Alternative would likely have somewhat lower ridership due to inferior performance and/or inability to reach the TTC in the long-run which would mean less localized traffic also at the expense of worse conditions on arterial and regional roadways and overall higher VMT. . The fifth alternative involving the installation of the OCS using a factory train would not) would have the same traffic impacts as the Proposed Project.

Four of the five alternatives analyzed in detail in the FEIR would avoid impacts associated with lowering vertical height clearances for freight trains (the Factory Train Alternative would have the same impact as the Proposed Project on vertical height clearances).

The reasons for rejecting the five alternatives analyzed in the FEIR are presented later in the section below *Findings Regarding the Alternatives*. Other alternatives were considered and screened out of the range of alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

Findings Regarding Significant Effects Mitigated to Less-Than-Significant Levels

The JPB has determined that, for the following effects, mitigation measures included in the FEIR will mitigate the effects of the PCEP to a less-than-significant level. The following identifies the pertinent mitigation measures by number and summary title. The full text of each of the mitigation measures cited below is found in the FEIR and that text is hereby incorporated by reference.

Aesthetics

Significant Effect: AES-2a - Substantially degrade the existing visual character or quality of the site and its surroundings (construction, the OCS, TPFs, and overbridge protection).[7]

Finding: The JPB hereby makes finding (a)(1) (described in Section 3.1 above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Installation of OCS poles and wires and vegetation clearance outside the right of way on industrial or commercial land would be consistent with the existing visual character. Installation of OCS poles and wires and vegetation clearance outside the right of way also would occur in residential areas and parks where visual quality can be moderate to high, depending on their individual setting. Construction activity in residential and park areas would be anomalous, and the visual character of such areas would be partially degraded during construction. The duration of OCS construction at any one location would be limited to the time necessary to install pole foundations and then later to install poles and string wires. The change in visual character would only occur for a limited period and the perception of the visual quality of such areas would not be altered once construction is complete.

The following measure mitigates this impact to a less than significant level.

- AES-2a: Minimize OCS construction activity on residential and park areas outside the Caltrain ROW

Mitigation Measure AES-2a would ensure that the duration of construction disruption and activities in areas of greater visual sensitivity would be limited by avoiding the use of such areas for access or staging areas and removing all construction equipment and materials immediately following completion of construction on such sites.

Significant Effect: AES-2b - Substantially degrade the existing visual character or quality of the site and its surroundings during Proposed Project operation

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Permanent impacts of the PCEP on visual character would result from 1) introduction of the new Traction Power Facilities (TPFs) inside and outside the Caltrain right of way, 2) OCS poles and wires, and 3) overbridge protection structures. (See separate discussion of tree removal impacts on visual aesthetics above).

The existing ROW is a long-standing active transportation corridor. The ROW is not a natural landscape feature; it contains train rails, warning signs and lights, overhead signal bridges, spur tracks, and the frequent presence of passenger trains and freight trains with their attendant visual features, engine noise, and horn noise at grade crossings. In some areas, the ROW includes elevated embankments and grade separations that can be substantial structures. In certain areas, such as Mountain View and Millbrae, other transit facilities such as VTA light rail and BART are adjacent to the JPB ROW. In certain areas, including in South San Francisco, in Redwood City, in Santa Clara and San Jose, there are extensive freight tracks and freight train movements. In many locations, there is existing overbridge fencing protection and fencing along the ROW. The Caltrain corridor is an active transportation corridor with

[7] Note: See discussion above concerning the significant and unavoidable impact associated with tree removal on visual character.

intense activity and infrastructure that can be different from adjacent residential and commercial areas. The ROW has been an active transportation corridor for approximately 150 years and has operated as Caltrain commuter rail for decades. As a result, an intensity of transportation-related infrastructure and operations is the expected aesthetic character of the ROW. The addition of OCS poles and wires along the ROW will introduce a new linear visual feature, but not one that is out of character with an active transportation character.

Utility wires are a normal part of the ROW and the adjacent landscape and do not inherently compromise the visual character of adjacent areas. The addition of new poles and wires for the OCS along the Caltrain ROW would not be an unprecedented visual feature in areas with existing overhead poles and wires. As shown in the new visual simulations in the EIR along Alma Street in Palo Alto (Figure 3.1-9b) and along Ravenswood (Figure 3.1-19a) and Glenwood (Figure 3.1-19b) Avenues in Menlo Park, the addition of OCS poles and wires would not substantially change the visual character of views along these roadways toward the Caltrain ROW. The addition of new poles and wires for the OCS along the Caltrain ROW would not be an unprecedented visual feature in areas with existing overhead poles and wires. As shown in the new visual simulations in the EIR along Alma Street in Palo Alto and along Ravenswood and Glenwood Avenues in Menlo Park, the addition of OCS poles and wires would not substantially change the visual character of views along these roadways toward the Caltrain ROW. The poles and wires can be observed at grade crossings and when looking directly at the ROW, but then when shifting view laterally, the poles and wires are usually obscured from view by existing vegetation outside the ROW and/or other existing development.

The ROW is not readily observable from ground-level areas that are not directly adjacent to the ROW itself. The view of a long line of poles and wires shown in the visual simulations looking down the ROW, such as at Churchill Avenue in Palo Alto or Oak Grove in Burlingame is only available when crossing the ROW itself or at Caltrain stations and rarely from any other locations due to intervening vegetation and structures. From other viewpoints directly along the ROW, such as at residences with a clear view of the ROW, several poles and the immediately adjacent wires will be observable when looking at the ROW, but residences are usually setback somewhat from the ROW and intervening vegetation, fences or structures often obscure the view down the ROW except when standing right at the ROW fence itself. From streets that are not directly parallel to the ROW, it is difficult to see the ROW and will be difficult to readily observe the poles and wires due to intervening structures and vegetation. When considering the visual character of a city or a neighborhood, one must consider the full range of views available throughout daily activities and whether a new visual feature does or does not become a dominant feature that actually defines the character of an area. While the new OCS poles and wires will become part of the visual character of the Caltrain ROW itself (consistent with its current transportation intense character), and will affect certain immediate views from directly adjacent residential, commercial and park areas, the new OCS poles and wires will, over time become more of a background condition to the visual character, like the existing utility poles and wires shown in the new simulations in Menlo Park and Palo Alto.

While poles and wires themselves would not inherently result in a significant change in visual character of an existing transportation corridor for the reasons noted above, depending on design of the poles in particular, they might become more readily observable instead of blend into the background. For example, if the OCS poles were to have a shiny steel finish, this would make the poles stand-out due to sun glare on the finish, which would make them abnormally obvious and would not more readily become part of the long-range background.

Thus, although the OCS poles and wires alone would not necessarily result in a significant aesthetic impact, unusually vivid OCS pole designs or colors could result in more overtly obvious changes in visual

character that would not help the system to fade into the background as one moves away from the Caltrain ROW and that would be considered a significant effect on visual character.

The following measures mitigate this impact to a less than significant level.

- AES-2b: Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers
- CUL-1d: Implement design commitments at historic railroad stations

Mitigation Measure AES-2b contains specific provisions for OCS pole design, TPFs, and overbridge protection structures to ensure that infrastructure will be designed in a manner that allows these features to blend with the surrounding built and natural environments as much as possible. Mitigation Measures CUL-1d, which requires specific design commitments by station and ensures that OCS poles recede into the visual landscape as much as feasible, would avoid potential impacts on historic rail stations.

Significant Effect: AES-4a - Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area during construction

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Some of project construction would be accomplished at night. Artificial lighting onto the worksite could result in "spill over" light or glare in adjacent residential areas.

The following measure mitigates this impact to a less than significant level.

- AES-4a: Minimize spill over light during nighttime construction.

Under Mitigation Measure AES-4a, the JPB will require the project contractor to ensure that construction crews working at night to minimize spill over light or glare in adjacent residential areas.

Significant Effect: AES-4b - Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area during operations

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The TPFs and OCS facilities have the potential to cause minor increases in glare. While not substantial in most instances, this glare would reinforce the industrial character of the electrical infrastructure and would have a significant impact on sensitive receptors at residences or parks along the Caltrain right of way. Installation of new nighttime lighting may be required for new TPFs for security purposes and could result in significant visual impacts if this lighting spilled outside of the site boundaries, creating a new source of nuisance lighting or glare to adjacent sensitive viewers.

The following measures mitigate these impacts to a less than significant level.

- AES-2b: Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers.
- AES-4b: Minimize light spillover at TPFs.

Mitigation Measure AES-2b would reduce glare associated with TPFs and OCS facilities to a less-than-significant level by requiring paint color treatment to reduce glare and the visual obviousness of new facilities. Mitigation Measure AES-4b mandates specific lighting design features that will minimize light spillover.

Significant Effect: CUMUL-1-AES – Cumulative impact on visual aesthetics during construction.

Finding: The JPB hereby makes finding (a)(1) (described in above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: As described in Section 3.1, *Aesthetics*, of the FEIR, the character of the areas adjacent to the Caltrain corridor vary from residential to commercial to industrial and includes a number of park areas as well. Cumulative construction would be most out of character in residential and park areas and less out of character in commercial and industrial areas or in transportation corridors. Where construction activities are present for an extended period of time in or directly adjacent to residential or park areas, there could be a temporarily significant aesthetic impact.

Installation of new nighttime lighting may be required for new TPFs for security purposes and could result in significant visual impacts if this lighting spilled outside of the site boundaries, creating a new source of nuisance lighting or glare to adjacent sensitive viewers.

The following measures mitigate these impacts to a less than significant level.

- AES-2a: Minimize OCS construction activity on residential and park areas outside the Caltrain ROW.
- AES-4a: Minimize spill over light during nighttime construction.

Mitigation Measure AES-2a will minimize the PCEP's temporary impacts on residential and park areas outside the Caltrain right of way. Although other cumulative projects may also result in a temporary change of visual character of areas adjacent to the Caltrain right of way during construction, with the recommended mitigation measure, the PCEP's contribution to cumulative temporary changes in visual character would be less than considerable.

Mitigation Measure AES-4a mandates specific lighting design features that will minimize light spillover and thereby avoid a cumulatively considerable contribution.

Air Quality

Significant Effect: AQ-2a - Violate any air quality standard or contribute substantially to an existing or projected air quality violation during Proposed Project construction.

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: PCEP construction has the potential to create air quality impacts through the use of heavy-duty construction equipment, construction worker vehicle trips, and truck hauling trips. Maximum daily NO_X emissions generated in 2017 and 2018 would exceed the Bay Area Air Quality Management District's (BAAQMD's) significance threshold. Emissions would result primarily from offroad equipment and haul truck trips. In addition, fugitive dust emissions would result from grading associated with the traction power substations and the switching and paralleling stations.

The following measures mitigate these impacts to a less than significant level.

- AQ-2a: Implement BAAQMD basic and additional construction mitigation measures to reduce construction-related dust
- AQ-2b: Implement BAAQMD basic and additional construction mitigation measures to control construction-related ROG and NO_X emissions
- AQ-2c: Utilize clean diesel-powered equipment during construction to control construction-related ROG and NO_X emissions

Mitigation Measures AQ-2a and AQ-2b outline the BAAQMD's basic and advanced construction mitigation measures for exhaust and fugitive dust emissions. As demonstrated by the modeling undertaken for the FEIR, Mitigation Measure AQ-2c will reduce NO_X emissions and requires offroad equipment to be rated Tier 3 or higher (FEIR, Chapter 3.2, *Air Quality*, Impact AQ-2a).

Significant Effect: AQ-3 - Cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The BAAQMD has identified project-level thresholds to evaluate criteria pollutant impacts (see Table 3.2-4 of the FEIR). In developing these thresholds, BAAQMD considered levels at which project emissions would be cumulatively considerable. The criteria pollutant thresholds presented in Table 3.2-4 of the FEIR therefore represent the maximum emissions the Proposed Project may generate before contributing to a cumulative impact on regional air quality.

The following measures mitigate these impacts to a less than cumulatively considerable level.

- AQ-2a: Implement BAAQMD basic and additional construction mitigation measures to reduce construction-related dust
- AQ-2b: Implement BAAQMD basic and additional construction mitigation measures to control construction-related ROG and NO_X emissions
- AQ-2c: Utilize clean diesel-powered equipment during construction to control construction-related ROG and NO_X emissions

As discussed under Impact AQ-2a, construction emissions associated with the PCEP would be reduced to below thresholds BAAQMD's by Mitigation Measures AQ-2a, AQ-2b, and AQ-2c. Therefore, they would avoid a cumulatively considerable contribution.

Significant Effect: CUMUL-2-AQ – Cumulative effects on air quality.

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: During construction of the cumulative projects listed in Table 4-3 and the overall growth shown in Table 4-1 of the FEIR, criteria pollutants that could impact air quality in the San Francisco air basin would be emitted. Construction of the cumulative projects may emit criteria pollutants singularly that could exceed the allowable threshold for criteria pollutants in the basin or could exceed these thresholds for the combined effect of cumulative construction that occurs at the same time.

Therefore, the cumulative projects would have a significant cumulative impact on air quality due to construction.

From an operational perspective, the PCEP would substantially improve both local and regional air quality. Reductions in Caltrain system criteria pollutant emissions compared with existing (2013) conditions would range from 66 to 86 percent in 2020 and more for 2040 with full electrification. Toxic air contaminant health risks along the Caltrain corridor between San Jose and San Francisco due to train emissions would be reduced by 87 percent in 2020 and by 100 percent in 2040 with full electrification compared to existing conditions.

The following measures mitigate these impacts to a less than significant level.

- AQ-2a: Implement BAAQMD basic and additional construction mitigation measures to reduce construction-related dust
- AQ-2b: Implement BAAQMD basic and additional construction mitigation measures to control construction-related ROG and NO_X emissions
- AQ-2c: Utilize clean diesel-powered equipment during construction to control construction-related ROG and NO_X emissions

In the Bay Area, all discretionary projects evaluate their construction air quality emissions and usually compare them to the BAAQMD's construction daily or annual thresholds for criteria pollutants. The BAAQMD's thresholds are designed so that if all projects meet those thresholds, then regionally construction would not have a significant effect on regional air quality. The PCEP will not exceed any BAAQMD thresholds, therefore it will make a less than considerable contribution for construction. For operations, the PCEP will reduce criteria pollutants relative to existing and No Project conditions and thus would have a beneficial contribution.

Biological Resources

Significant Effect: BIO-1a: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service during Proposed Project construction.

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The Caltrain right of way is primarily a disturbed urban rail corridor with only limited biological resources. For the most part, the PCEP would disturb areas of a ruderal and previously disturbed character with limited potential for special-status species. The overall scale of potential disturbance would be limited because the PCEP construction within the Caltrain right of way would primarily consist of installing OCS poles with a limited permanent footprint for pole foundations (the OCS poles would be 1 to 2 feet in diameter). For the TPFs within the right of way, the overall footprint would be only 0.8 acres and most of the TPFs in the ROW are in areas that are previously disturbed. For the two TPSs outside the right of way, the overall footprint would be only 1.4 acres and both traction power substations would be in highly urbanized areas with limited habitat value. Special-status plant species have the potential to occur in undeveloped areas with suitable habitat, namely areas that support natural land cover. As noted in Appendix G of the Draft EIR, such areas are only found in limited portions of the Caltrain right of way, which is dominated by disturbed and ruderal conditions.

Where suitable habitat occurs, project construction would have the potential to result in direct take of special-status plant species through crushing and indirect take of special-status plant species through habitat modification or loss, if they are actually present.

Project construction would not directly affect streams and thus would not directly affect aquatic species. However, the PCEP does have the potential to release pollutants into storm drain systems and directly into the drainages themselves. These pollutants would degrade the physical conditions of the water features and could result in direct or indirect mortality of Central California steelhead, other aquatic and partially aquatic species (i.e., San Francisco garter snake, western pond turtle, California tiger salamander, and California red-legged frog,), and species that depend on aquatic prey (i.e., great blue heron and snowy egret). Releases of pollutants could also result in habitat loss. Releases of contaminants from construction equipment and supplies could affect the creeks passing under the project corridor; however, implementation of the Storm Water Pollution Prevention Plan (SWPPP) for the PCEP and the mitigation measures specified below would avoid and reduce the amount of runoff into the creeks during construction as required by the CWA Section 401 Permit that would need to be obtained prior to Project initiation. Implementation of the PCEP's SWPPP is expected to avoid impacts on aquatic habitat in the drainages crossed by the Proposed Project and consequently, on central coast steelhead. Details of the Proposed Project's SWPPP are further explained in Section 3.9, *Hydrology and Water Quality,* of the FEIR.

Although the potential to encounter special-status species is low, construction activities and related effects would still have potential to disturb habitat and individual San Francisco garter snake, western pond turtle, California tiger salamander, California red-legged frog, pallid bat, hoary bat, fringed myotis, western burrowing owl, northern harrier, white-tailed kite, American peregrine falcon, saltmarsh common yellow throat, purple martin, and other nesting birds.

The following measures mitigate these impacts to a less than significant level.

- BIO-1a: Implement general biological impact avoidance measures
- BIO-1b: Implement special-status plant species avoidance and revegetation measures
- BIO-1c: Implement California red-legged frog and San Francisco garter snake avoidance measures
- BIO-1d: Implement western pond turtle avoidance measures
- BIO-1e: Implement Townsend's big-eared bat, pallid bat, hoary bat, and fringed myotis avoidance measures
- BIO-1f: Implement western burrowing owl avoidance measures
- BIO-1g: Implement northern harrier, white-tailed kite, American peregrine falcon, saltmarsh common yellowthroat, purple martin, and other nesting bird avoidance measures
- BIO-1h: Conduct biological resource survey of future contractor-determined staging areas
- BIO-1i: Minimize impacts on Monarch butterfly overwintering sites
- BIO-1j: Avoid nesting birds and bats during vegetation maintenance

Under Mitigation Measures BIO-1a and BIO-1h, all sensitive habitat and wetland areas would be identified for avoidance during project design where feasible. Mitigation Measure BIO-1b would ensure that impacts on the species of special status plants that may be found on the site are minimized through surveys, avoidance where feasible, and specific performance standards for revegetation if necessary.

Mitigation Measures BIO-1c through BIO-1g include species-specific requirements and performance standards to ensure that the project will not adversely affect those species with the potential to be on site. No known Monarch butterfly overwintering sites are found within the project area. Implementation of Mitigation Measure BIO-1i would avoid disrupting overwintering sites should any be found prior to construction.

Significant Effect: BIO-1b: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service during Proposed Project operation.

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: With the OCS, there would be a need for vegetation maintenance to ensure safe clearances are provided between vegetation and energized elements of the OCS in the ESZ. Vegetation clearance activities occur today under existing conditions to maintain a clear accessway for trains, but the level of vegetation clearance in the future would be larger given the OCS clearance needs. Thus, there would be an increased potential to disturb nesting birds and bats due to annual vegetation maintenance.

The following measure mitigates this impact to a less than significant level.

- BIO-1j: Avoid nesting birds and bats during vegetation maintenance

Mitigation Measure Bio-1j would ensure that impacts on nesting birds and bats would be less than significant by prescribing specific requirements to avoid impacts.

Significant Effect: BIO-2a: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations during Proposed Project construction

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The Caltrain right of way is primarily a disturbed urban rail corridor with only limited biological resources. The PCEP would impact areas of riparian vegetation, wetlands and sensitive natural communities during construction but routine project mitigation would reduce these impacts to a less-than-significant level.

The following measures mitigate these impacts to a less than significant level.

BIO-1a: Implement general biological impact avoidance measures
BIO-1b: Implement special-status plant species avoidance and revegetation measures
BIO-1h: Conduct biological resource survey of future contractor-determined staging areas
BIO-2: Implement serpentine bunchgrass avoidance and revegetation measures
BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan

No project features would be constructed within any stream or riparian areas. However, construction of the PCEP could result in removal of some riparian trees and other riparian vegetation where necessary for electrical safety clearances. The implementation of Mitigation Measure BIO-1a would further identify

sensitive habitat during Project design and require avoiding such sensitive habitats during construction as feasible. However, removal of riparian vegetation may still be necessary in order to provide electrical safety clearances. Mitigation Measure BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan (see discussion below) would require replacement of removed trees or other riparian vegetation as close to the source of impact as possible, which would result in replacement of riparian trees/vegetation along any areas of disturbed riparian habitat. With these measures, impacts on riparian trees and vegetation would be less than significant.

There is a small area (0.2 mile) of the project alignment in San Jose south of the proposed location of PS7 at Communications Hill that the *Santa Clara Valley Habitat Plan* maps as serpentine bunchgrass grassland. Serpentine bunchgrass grassland is a sensitive natural community designated by CDFW because the community often supports rare plant and wildlife species. In this area, the only proposed PCEP activities would be installation of OCS poles and wires adjacent to the existing tracks. It is unknown whether or not there is actual serpentine bunchgrass grassland in the area adjacent to the existing tracks.. Mitigation Measures BIO-1a and BIO-1b would apply to this area and would require minimization, avoidance, and revegetation if special-status plants are identified in this area, which would address rare plants that may occur within this vegetation community. Implementation of Mitigation Measures BIO-2 and BIO-1h would ensure that impacts to serpentine bunchgrass grassland would be less than significant.

Significant Effect: BIO-3: Have a substantial adverse effect on federally protected waters or wetlands as defined by Section 404 of the Clean Water Act or state waters or wetlands through direct removal, filling, hydrological interruption, or other means

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: A few potentially jurisdictional state and federal waters and wetlands occur within the project corridor. If construction were to take place within those areas, construction could disturb or result in the loss of waters or wetlands.

The following measures mitigate these impacts to a less than significant level.

- BIO-1a: Implement general biological impact avoidance measures
- BIO-1h: Conduct biological resource survey of future contractor-determined staging areas
- BIO-3: Avoid or compensate for impacts on wetlands and waters
- HYD-1: Implement construction dewatering treatment

Mitigation Measures BIO-1a and BIO-1h would require JPB to identify wetlands and waters during Project design and avoid such sensitive habitats during construction, where feasible. It should be feasible to avoid all waters and wetlands along the entire Caltrain right of way for OCS pole installation, but if permanent loss any waters/wetlands is necessary, then Mitigation Measure BIO-3 would apply.

For potential construction staging areas within the right of way, potential wetlands or waters were identified at nine different potential staging areas. Potential construction staging areas outside the right of way have not yet been identified but may contain waters or wetlands. Mitigation Measures BIO-1a, BIO-1h, and BIO-3 would apply to all staging areas containing waters or wetlands. With the implementation of Mitigation Measures BIO-1a, BIO-1h, and BIO-3, direct impacts on waters and wetlands would be less than significant overall.

Regarding indirect effects, the JPB will develop and implement the required SWPPP, as described in Section 3.9, *Hydrology and Water Quality* of the FEIR. In addition, Mitigation Measure HYD-1 will address any indirect water quality impacts on wetlands related to dewatering that may occur during construction.

Significant Effect: BIO-5a: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance during Proposed Project construction.

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Trees that are located along or within 10 feet of the energized elements of OCS alignment would need to be removed or pruned in order to provide adequate safety clearance from the energized elements of the OCS. It is ordinary JPB maintenance practice to comply with California Public Utility Commission requirements by pruning trees and other mature vegetation from adjacent properties that lean into or hang over the Caltrain right of way and pose a potential hazard to safe train operations. The tree maintenance program would need to be expanded to provide the new clearance around the OCS.

The majority of the trees and vegetation that would require removal or pruning are eucalyptus, oleander, and other windrow species; some coast live oaks and other native and horticultural species would also need to be removed or pruned. Table 3.3-4 of the FEIR provides a profile of the estimated trees to be removed, by city. As discussed in Appendix F, *Tree Inventory and Canopy Assessment*, of the EIR, some of the trees to be removed or pruned are designated heritage trees in local tree ordinances. PCEP construction would likely require removal of approximately 1,000 trees and pruning of an additional 3,200 trees for the OCS alignment and electrical safety zone (and up to 2,200 trees removed and 3,600 trees pruned under worst-case assumptions). Project mitigation would require tree avoidance, minimization, and/or replacement.

The following measures mitigate these impacts to a less than significant level.

- BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan

Mitigation Measure BIO-5 contains specific requirements for final tree surveys, avoidance, protective fencing of trees that are not to be removed, tree and root pruning, tree replacement, and maintenance and monitoring of all replanted trees to assure their survival and/or remedial replanting in case they do not survive. Pursuant to that mitigation measure, JPB will avoid and/or minimize impacts on trees along the right of way by locating OCS poles and alignment to minimize tree removal and pruning where consistent with safety, operations, and maintenance requirements. Options to reduce impact include removing trees only as necessary to provide adequate safety clearance; locating OCS poles and alignment to minimize tree removals; and use of center poles, two-track cantilever poles, portals, or offset insulator poles, and where consistent with operational and safety requirements. Where tree removal is unavoidable after implementation of avoidance and minimization measures, then the JPB will replace trees in accordance with the performance standards in Mitigation Measure BIO-5.

Significant Effect: BIO-6a: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: There are no adopted habitat conservation plans (HCPs) or natural community conservation plans (NCCPs) for the project area in San Francisco or San Mateo Counties. There is an adopted HCP/NCCP in Santa Clara County (the *Santa Clara Valley Habitat Plan* or SCVHCP) that covers a portion of the project area from just south of the Santa Clara Station to the southern end of the project area several miles south of Tamien Station. The PCEP is not specifically a covered activity in the SCVHCP; thus, the SCVHCP requirements may not apply to the PCEP.

Within the SCVHCP plan area, the only project facilities would be the OCS, TPS2, and PS7. The SCVHCP has a fee payment system to compensate for impacts on covered species habitat. All three TPS2 options and PS7 would be in areas mapped by the SCVHCP as urban land cover and, thus, development of these sites would be consistent with the SCVHCP and require no land cover fee payment. The TPS2 Option 1 site consists of a ruderal grass field surrounded by industrial development but is within the burrowing owl survey and fee zone of the SCVHCP. The TPS2 Options 2 and 3 sites are both in developed areas and would not be subject to any fee or compliance with the SCVHCP. A small portion (0.2 mile) of the project alignment south of PS7 is mapped as serpentine bunchgrass grassland and is within Landcover Fee Zone A and the Serpentine Fee zone. Another small portion (0.4 mile) immediately south of the grassland area is mapped as urban park land, although there is no park within the Caltrain right of way, and is within Land Cover Fee Zone B. The OCS poles would be placed along the railroad alignment, which is mostly previously disturbed and thus OCS pole construction would have very limited impacts on covered species habitat. It is unclear if the PCEP would or would not be subject to fees if the SCVHCP is determined to cover the Proposed Project.

The following measure mitigates these impacts to a less than significant level.

- BIO-6: Pay *Santa Clara Valley Habitat Plan* land cover fee (if necessary)

At this time, it is unknown whether or not the Proposed Project is covered by the SCVHCP and thus whether JPB could obtain Endangered Species Act (ESA) coverage for the portions of the PCEP within the SCVHCP area. If not covered by the SCVHCP, JPB would obtain a separate authorization under the federal and state ESAs from the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) as necessary to address any potential take of federally or state-protected species and thus would mitigate for those effects separately from the SCVHCP.

Incidental take authorization from either USFWS or CDFW is a discretionary action granted at the end of an intensive permitting process involving site-specific study, collaborative development of conservation plans, and implementation of the specific requirements set out in those plans. The JPB cannot undertake any activity that would result in the "take" of a species protected under the federal or state ESA without prior approval of an incidental take permit from the USFWS or CDFW, or both, depending upon the affected species. The provisions of the incidental take permit would be enforced on JPB by the USFWS and/or CDFW.

If separate authorization under the ESAs is necessary, then Mitigation Measure BIO-6 would not be required. If it is determined that JPB could address impacts within the SCVHCP area through the Plan, then Mitigation Measure BIO-6 would be required and would impose SCVHCP requirements on the PCEP.

Significant Effect: CUMUL-3-BIO: Cumulative effects on biological resources

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: As described in Section 3.3, *Biological Resources* of the FEIR, the PCEP could have significant impacts to special-status species, riparian habitats or other sensitive natural communities, protected wetlands or waters and to trees along the Caltrain right of way during construction, unless mitigated.

While increased train traffic would occur with HSR operations and the PCEP, operational conditions are not expected to be significantly different from pre-project conditions relative to biological resources. Routine tree maintenance would be conducted along the Caltrain right of way for all areas where OCS clearance is required, but these activities would be similar to existing maintenance practices albeit they would be conducted in more expansive areas and more frequently than at present. Where development occurs on existing vacant sites, there could be increases in the stormwater runoff which could degrade water quality in surface waters downstream of the Caltrain right of way corridor and affect aquatic species. However, current water quality regulations implemented through the countywide stormwater NPDES permits requires treatment of stormwater runoff for substantial new projects precisely to manage the cumulative impact on water quality of new development in the corridor.

- BIO-1a: Implement general biological impact avoidance measures
- BIO-1b: Implement special-status plant species avoidance and revegetation measures
- BIO-1c: Implement California red-legged frog and San Francisco garter snake avoidance measures
- BIO-1d: Implement western pond turtle avoidance measures
- BIO-1e: Implement Townsend's big-eared bat, pallid bat, hoary bat, and fringed myotis avoidance measures
- BIO-1f: Implement western burrowing owl avoidance measures
- BIO-1g: Implement northern harrier, white-tailed kite, American peregrine falcon, saltmarsh common yellowthroat, purple martin, and other nesting bird avoidance measures
- BIO-1h: Conduct biological resource survey of future contractor-determined staging areas
- BIO-1i: Minimize impacts on Monarch butterfly overwintering sites
- BIO-1j: Avoid nesting birds and bats during vegetation maintenance
- BIO-2: Implement serpentine bunchgrass avoidance and revegetation measures
- BIO-3: Avoid or compensate for impacts on wetlands and waters
- HYD-1: Implement construction dewatering treatment
- BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan
- BIO-6: Pay *Santa Clara Valley Habitat Plan* land cover fee (if necessary)

With implementation of Mitigation Measures BIO-1a through BIO-1h (special-status species), BIO-2 (sensitive natural communities), BIO-3 (wetlands and waters), BIO-5 (tree avoidance, minimization, and replacement) and BIO-6, the PCEP's project-level impacts on biological resources due to construction would be reduced to a less-than-significant level. The PCEP construction would not occur in pristine areas, but, rather, in a developed rail corridor; thus, impacts would be to remnant biological resources within that context. Given that context, with mitigation, the PCEP's residual construction impacts would

be limited in scale and extent. Consequently, PCEP construction, with mitigation, would make a less than considerable contribution to any potential cumulative impacts on biological resources.

As described in Section 3.3, *Biological Resources* of the FEIR, the PCEP could have significant impacts to nesting bird or bat species during tree maintenance along the Caltrain right of way if not mitigated. However, with implementation of Mitigation Measure BIO-1j, impacts due to disruption of bird nesting or bat roosting would be reduced to a less-than-significant level. Therefore, the PCEP would not contribute to cumulative operational impacts.

Cultural Resources

Significant Effect: CUL-1 - Cause a substantial adverse change in the significance of historic built resources pursuant to Section 15064.5

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: There is the potential that the PCEP could result in a change to the significance of archaeological and historic built resources (considered "historical resources," as defined under CEQA). The known historic built resources in the Historical Study Area, which includes the Caltrain right of way, one parcel on either side of the traction power facility sites and areas along the right of way needed for OCS poles and/or vegetation clearance for electrical safety, are listed in Table 3.4-2 of the FEIR. The PCEP would result in potentially significant impacts to some of the identified historic properties unless mitigated.

The PCEP has four different potential impacts on Railroad Tunnels 1 through 4 in San Francisco: notching of the interiors of the tunnels to provide clearance for the OCS infrastructure above freight and passenger trains; removal of a portion of the decorative stone portals outside the tunnels when notching; installation of OCS infrastructure in the tunnel lining; and track lowering for vertical clearance. All potentially significant impacts on the tunnels could be mitigated to a less-than-significant level, with the exception of the impact on the decorative portal of Railroad Tunnel 4.

The Proposed Project would install OCS poles and wires adjacent to seven of eight historically significant railroad stations. Due to the location of poles and OCS in relation to seven of eight stations, impacts would be less than significant. At the eighth station, Diridon Station, the OCS would be placed on the passenger platforms and extend through the existing umbrella sheds used as passenger shelters. Because these shelters are a contributing feature of this NRHP-listed station, impacts at this location would be significant, but can be mitigated through mitigation identified below.

The following measures mitigate these impacts to a less than significant level.

- CUL-1a: Evaluate and minimize impacts on structural integrity of historic tunnels
- CUL-1b: Minimize impacts on historic decorative tunnel material
- CUL 1c: Install project facilities in a way that minimizes impacts on historic tunnel interiors
- CUL-1d: Implement design commitments at historic railroad stations
- CUL-1f: Implement historic bridge and underpass design requirements
- BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan

Mitigation Measures CUL-1a through CUL-1c would mitigate impacts on the historic Railroad Tunnels in San Francisco by requiring design features that will minimize the changes to the tunnels such they are not adverse. Mitigation Measure CUL-1d contains station-specific design standards for pole installation that will mitigate potential impacts at the Millbrae, Burlingame, Atherton, Menlo Park, Palo Alto, Santa Clara (station and tower), and Diridon stations. Mitigation Measure CUL-1f contains specific design standards to mitigate the potential impacts to nine historic bridges/underpasses by ensuring that the power system supports are not attached to the historic fabric of these bridges/underpasses, thereby avoiding adverse impacts on their historic integrity and visual appearance. Mitigation Measure BIO-5 will avoid a significant impact to "El Palo Alto" tree from minor pruning necessary to keep tree branches out of the San Francisquito Bridge truss. The measure stipulates that a Tree Avoidance, Minimization, and Replacement Plan (including specific attention to minimization of effects on El Palo Alto) will be developed by a certified arborist in consultation with the City of Palo Alto Urban Forester. Mitigation Measure BIO-5 also includes measures to require replanting with eucalyptus for any necessary replantings associated with the historic Burlingame Francard Grove.

Significant Effect: CUL-2 - Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Table 3.4-1 of the FEIR presented the 21 identified archaeological resources— 19 prehistoric, one multi-component, and one historic-era archaeological— in or potentially in the PCEP's Archaeological Study Area. Additionally, documentary research identified three archaeologically sensitive zones: the area between Easton Creek and the east bank of San Mateo Creek identified as the "Hamilton shell mound sensitive zone"; the vicinity of the Third Mission Santa Clara [CA-SCL-30/H]; and the Native American burial ground at Tamien Station [CA-SCL-690]. Because all areas of potential ground disturbance have not been surveyed for cultural resources, some portions of the Archaeological Study Area, as well as some areas outside of the Archaeological Study Area where OCS poles and wires would be placed partially outside the existing Caltrain right of way, and where vegetation maintenance would be required within 10 feet of the OCS pole alignment for electrical safety, are sensitive for archaeological resources. Therefore, there is a potential to encounter heretofore unidentified buried cultural resources and potential ground disturbance from construction

The following measures mitigate these impacts to a less than significant level.

- CUL-2a: Conduct an archaeological resource survey and/or monitoring of the removal of pavement or other obstructions to determine if historical resources under CEQA or unique archaeological resources under PRC 21083.2 are present
- CUL-2b: Conduct exploratory trenching or coring of areas where subsurface project disturbance is planned in those areas with "high" or "very high" potential for buried site
- CUL-2c: Conduct limited subsurface testing before performing ground-disturbing work within 50 meters of a known archaeological site
- CUL-2d: Conduct exploratory trenching or coring of areas within the three zones of special sensitivity where subsurface project disturbance is planned
- CUL-2e: Stop work if cultural resources are encountered during ground-disturbing activities

- CUL-2f: Conduct archaeological monitoring of ground-disturbing activities in areas as determined by JPB and SHPO

If specific prehistoric, ethnographic, and/or historic archaeological resources are identified within the proposed disturbance areas as a result of Mitigation Measures CUL-2a through CUL-2d, then the evaluation and treatment of such resources will be conducted according to the measures set forth in Mitigation Measure CUL-2e. Under Mitigation Measure CUL-2e, if the find is determined to be potentially significant, the archaeologist, in consultation with the Native American representative, shall develop a treatment plan that could include site avoidance, capping, or data recovery. Mitigation Measure CUL-2f provides for the additional monitoring of project operations within recorded site boundaries to ensure that previously undiscovered resources are properly assessed and treated. Implementing these measures would reduce this impact to a less-than-significant level.

Significant Effect: CUL-3: Disturb any human remains, including those interred outside of formal cemeteries

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: There is the potential that the PCEP could disturb human remains, including those interred outside of formal cemeteries. There are two known archaeological resources that are known to contain human remains: the vicinity of the Third Mission Santa Clara [CA-SCL-30/H], and the Native American burial ground at Tamien Station [CA-SCL-690]). Previous investigations indicate that CA-SCL-30/H has been determined eligible to the NRHP, and CA-SCL-690 has been recommended eligible; however, neither has been listed. Some portions of the Archaeological Study Area, and within those areas outside of the Archaeological Study Area established for OCS pole placement and vegetation maintenance, are sensitive for archaeological resources, including human remains; and since there is a potential to encounter heretofore unidentified buried cultural resources, including human remains, potential ground disturbance from construction could result in a significant impact on such resources.

The following measures mitigate these impacts to a less than significant level.

- CUL-3: Comply with state and county procedures for the treatment of human remains discoveries

Implementing Mitigation Measure CUL-3 would reduce this impact to a less-than-significant level by requiring that any human remains and related items discovered shall be treated in accordance with the requirements of Section 7050.5(b) of the California Health and Safety Code and, if determined to be of Native American origin, pursuant to the provisions of Section 5097.98(a)-(d) of the California Public Resources Code.

Significant Effect: CUMUL-4-CUL: Cumulative effects on cultural resources

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings:
The following measures mitigate these impacts to a less than significant level.

- CUL-1a: Evaluate and minimize impacts on structural integrity of historic tunnels
- CUL-1b: Minimize impacts on historic decorative tunnel material

- CUL-1c: Install project facilities in a way that minimizes impacts on historic tunnel interiors
- CUL-1d: Implement design commitments at historic railroad stations
- CUL-1e: Implement specific tree mitigation considerations at two potentially historic properties and landscape recordation, as necessary
- CUL-1f: Implement historic bridge and underpass design requirements
- BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan
- CUL-2a: Conduct an archaeological resource survey and/or monitoring of the removal of pavement or other obstructions to determine if historical resources under CEQA or unique archaeological resources under PRC 21083.2 are present
- CUL-2b: Conduct exploratory trenching or coring of areas where subsurface project disturbance is planned in those areas with "high" or "very high" potential for buried site
- CUL-2c: Conduct limited subsurface testing before performing ground-disturbing work within 50 meters of a known archaeological site
- CUL-2d: Conduct exploratory trenching or coring of areas within the three zones of special sensitivity where subsurface project disturbance is planned
- CUL-2e: Stop work if cultural resources are encountered during ground-disturbing activities
- CUL-2f: Conduct archaeological monitoring of ground-disturbing activities in areas as determined by JPB and SHPO
- CUL-3: Comply with state and county procedures for the treatment of human remains discoveries

As discussed in Section 3.4, *Cultural Resources* of the FEIR, the implementation of Mitigation Measures CUL-1a through CUL-1f would reduce the PCEP's effects on historic tunnels, stations, and underpasses along the Caltrain right of way below the level of significance, with the exception of San Francisco Tunnel 4. Mitigation Measure BIO-5 would reduce the PCEP's effects on the historic El Palo Alto tree and the historic Francard Grove. While other cumulative projects may have significant impacts on the same historic resources affected by the PCEP and their impact may or may not be mitigable, the PCEP's residual impacts on these resources after PCEP mitigation would be minimal, except at Tunnel 4 where the PCEP would result in an individual impact. Therefore, the PCEP's potential contribution to cumulative impacts on historical resources due to construction would be less than considerable.

As discussed in Section 3.4, *Cultural Resources*, the implementation of Mitigation Measures CUL-2a, CUL-2b, CUL-2c, CUL-2d, CUL-2e, and CUL-2f would reduce the PCEP's effects on archaeological resources along the Caltrain right of way to a less-than-significant level. While other cumulative projects may have significant impacts on the same archaeological resources affected by the PCEP, the PCEP's residual impacts on these resources after PCEP mitigation would be minimal. Therefore, the PCEP's potential contribution to cumulative impacts on archaeological resources due to construction would be less than considerable. As discussed in Section 3.4, *Cultural Resources*, the PCEP would have no impact on cultural resources during operations. Therefore, there would be no cumulative cultural resource impacts resulting from PCEP operation, and the PCEP would make no contribution to any impact.

Electromagnetic Fields and Electromagnetic Interference

Significant Effect: EMF-2 - Substantially increase electromagnetic interference along the Corridor

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The main sources, or generators, of transient EMI disturbances from electrification would be switching currents produced by switching loads, relays, power controllers, and switch mode power supplies associated with operation of the OCS or the TPFs. High-current electronic switches and controls are capable of producing transient signals that can be transmitted along the power supply network to other electronic systems. Magnetic fields would also be generated by paralleling and switching stations, as well as traction power substations. These fields could affect the signal systems of the freight rail, BART, SCVTA and/or affect highly sensitive electronic equipment, such as certain medical imaging equipment.

The following measure mitigates this impact to a less than significant level.

- EMF-2: Minimize EMI effects during final design, Monitor EMI effects during testing, commission and operations, and remediate substantial disruption of sensitive electrical equipment

Mitigation Measure EMF-2 will require that EMI be further assessed on a site-specific basis during final project design to ensure avoidance of significant EMI effects above baseline conditions. As explained in Chapter 3.5, *Electromagnetic Fields and Electromagnetic Interference*, of the FEIR under Impact EMF-2, there is ample evidence that electrified trains can operate harmoniously with freight trains on the same line without adversely affecting the signal systems of the freight rail or other users. Existing technical solutions, such as those employed for electromagnetic compatibility along the Northeast Corridor in the United States or in Europe, are available to be employed for this project.

In addition to the mitigation measure, the PCEP includes mitigating features in its design. As described in FEIR Chapter 2, *Project Description*, the PCEP will protect the existing railroad signal system, the grade crossing system, and the Positive Train Control system from electromagnetic interference created by the 25kv AC system by:

- designing the catenary system using proven solutions that minimize the effect of EMI;
- providing sufficient shielding for electronic equipment;
- installing specialized components, such as filters, capacitors, and inductors; and
- ensuring that the electric vehicles are designed with a frequency that does not interfere with the frequency of the grade crossing warning system.

Significant Effect: CUMUL-5-EMF - Cumulative increase in electromagnetic fields or electromagnetic interference

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The concern with EMFs is potential health risks to receptors along the Caltrain right of way. As described in Section 3.5, *Electromagnetic Fields and Electromagnetic Interference*, the PCEP's EMF levels along the Caltrain right of way were estimated at up to 41 milliGauss (mG). With full electrification, EMF levels for Caltrain electrified service could increase by perhaps 25 percent. The EMF levels along the fenceline for Blended Service should be well below the threshold used in the PCEP FEIR of 833 mG. Thus, the PCEP would make a less than considerable contribution to potential health risks associated with EMFs.

The concern with EMI is potential interference with sensitive electrical equipment along the Caltrain right of way due to increased EMF levels. As explained above, before mitigation, the PCEP could result in EMI to adjacent freight and transit system signal systems and perhaps to some adjacent sensitive equipment in other settings.

The following measure mitigates this impact to a less than significant level.

- EMF-2: Minimize EMI effects during final design, Monitor EMI effects during testing, commission and operations, and remediate substantial disruption of sensitive electrical equipment

Mitigation Measure EMF-2 and elements of the PCEP design eliminate any potential significant effects associated EMI interference. As a result, the project would not contribute to any cumulative interference.

Geology and Soils

Significant Effect: GEO-1 - Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides.

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Strong ground shaking would be experienced along the PCEP line during an earthquake. During an earthquake, TPFs and OCS poles could be subject to liquefaction effects (such as foundation failure or settlement), if they are constructed on liquefiable soils and not properly designed for such soils.

The following measure mitigates this impact to a less than significant level.

- GEO-1: Perform a site-specific geotechnical study for traction power facilities

The PCEP would be located in a seismically active area and must, therefore, be constructed in accordance with the California Building Code. The California Building Code establishes standards intended to permit structures to withstand seismic hazards. To this end, the Code sets standards for excavation, grading, earthwork construction, fill embankments, expansive soils, foundation investigations, liquefaction potential, and soil strength loss. Additionally, Mitigation Measure GEO-1 would require the JPB to conduct site-specific geotechnical investigations for TPFs, the results of which will be used in the design specifications for the proposed TPF structures. Adherence to applicable building code requirements and implementation of Mitigation Measure GEO-1 would minimize potential construction and operational impacts of the proposed Project due to seismic ground shaking, seismic-related ground failure (including liquefaction), and landslides.

Significant Effect: GEO-3 - Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the Project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Underlying soils at the various TPF locations are prone to geologic hazards such as liquefaction and subsidence. Where construction of proposed TPFs and OCS poles is planned within areas with compressible and collapsible soils (as mentioned above), the structures would be susceptible to damage due to ground settlement from the weight of the structures or the addition of water in the form of irrigation or concentrated runoff.

The following measure mitigates this impact to a less than significant level.

- GEO-1: Perform a site-specific geotechnical study for traction power facilities

The PCEP must be constructed in conformance with the California Building Code. The Code sets standards for excavation, grading, earthwork construction, fill embankments, expansive soils, foundation investigations, liquefaction potential, and soil strength loss. Additionally, Mitigation Measure GEO-1 would require the JPB to conduct site-specific geotechnical investigations for TPFs, the results of which will be used in the design specifications for the proposed TPF structures. Adherence to applicable building code requirements and implementation of Mitigation Measure GEO-1 would minimize potential construction and operational impacts of the proposed Project due to unstable soils.

Significant Effect: GEO-4 - Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Expansive soils are typically composed of clays and can undergo a volume change with changes in moisture content. They have tendencies to expand and soften when wet and to harden when dry. If not properly considered prior to the construction of structures, this expansive behavior can damage foundations and other building components.

The following measure mitigates this impact to a less than significant level.

- GEO-4a: Identification of expansive soils
- GEO-4b: Mitigation of expansive soils

Mitigation Measures GEO-4a and GEO-4b would be implemented where construction of proposed TPFs and OCS poles are planned atop soils composed of clay or silty clays, which are expansive soils with high shrink-swell potential. The mitigation measures would ensure that soils are tested by a qualified geotechnical engineer and engineering geologist, and requisite actions are taken such as removing and replacing any expansive soils, or incorporating design features into foundations, in order to avoid this impact.

Significant Effect: CUMUL-6-GEO - Cumulative exposure of people or structures to geologic or seismic hazards or destruction of unique paleontological/geologic resources

Finding: The JPB hereby makes finding (a)(1) (described in Section 3.1 above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: New transportation, residential, commercial and other facilities and services could increase exposure of people or structures to geologic, seismic and soil hazards could result in a significant cumulative impact. The project area is likely to experience a strong seismic activity and

geologic instability (e.g., soil liquefaction or collapse) that could damage structures or expose people to greater risks of loss of life and injury. In addition, there could be cumulative exposure due to construction in areas of expansive soils.

The following measure mitigates this impact to a less than significant level.

- GEO-1: Perform a site-specific geotechnical study for traction power facilities
- GEO-4a: Identification of expansive soils
- GEO-4b: Mitigation of expansive soils

Implementation of Mitigation Measures GEO-1, 4a, and 4b would eliminate the PCEP's exposure to unacceptable risks of geologic, seismic and soil hazards. Therefore, the PCEP's contribution to the increase of exposure to these hazards would be less than considerable.

Hazards and Hazardous Materials

Significant Effect: HAZ-2 - Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Typical construction-related hazardous materials would be used during construction of the proposed Project, including gasoline, diesel, oil, other vehicle-related fluids, paints, solvents, and metals. It is possible that any of these substances could be released during construction activities. The proposed Project TPF locations lie within areas that are highly industrialized and commercial in nature. Contaminants of concern along the Caltrain right of way include arsenic, lead, and total petroleum hydrocarbons. Consequently, construction activities, including dewatering operations, could encounter soil and/or groundwater contamination. Operational activities would generate hazardous material waste due to the use of lubricants, solvents, and other materials.

The following measures mitigate this impact to a less than significant level.

- HAZ-2a: Conduct a Phase II Environmental Site Assessment prior to construction
- HAZ-2b: Implement engineering controls and best management practices during construction

Mitigation Measures HAZ-2a and HAZ-2b require that, prior to construction, the potential presence of contaminants in soil and groundwater will be investigated using conventional drilling, sampling, and chemical testing methods. Based on the chemical test results, a mitigation plan will be developed to establish guidelines for the disposal of contaminated soil and discharge of contaminated dewatering effluent, and to generate data to address human health and safety issues that may arise as a result of contact with contaminated soil or groundwater during construction. JPB will be required to provide a copy of this plan to the Department of Toxic Substances Control for review and approval prior to starting work on the PCEP. These measures, along with standard requirements for construction and operation, as discussed in Section 3.8, *Hazards and Hazardous Materials* and Section 3.9, *Hydrology and Water Quality* (discussion of SWPPP) of the FEIR will avoid the potential for significant effect.

Hazardous waste generated by PCEP operations would be managed according to all applicable regulatory requirements, which would minimize the exposure risk to all Caltrain personnel and the surrounding environment. Additionally, proposed PCEP infrastructure will be constructed with engineering controls to limit and contain releases and spills, thus further minimizing the potential for operational impacts.

Significant Effect: HAZ-4 - Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Due to the extent of the project corridor, construction of some of the TPFs and portions of the OCS would be surrounded by numerous sites found in various environmental databases.

The following measures mitigate this impact to a less than significant level.

- HAZ-2a: Conduct a Phase II Environmental Site Assessment prior to construction
- HAZ-2b: Implement engineering controls and best management practices during construction

Industrial, commercial and agricultural facilities that deal with storage, use, and disposal of hazardous materials within all proposed construction areas are required to comply with all appropriate federal, state and local regulations, such as the regulations discussed Section 3.8.1.1, *Regulatory Setting*, of the FEIR to ensure safety of the surrounding public and environment. Additionally, implementation of Mitigation Measures HAZ-2a and HAZ-2b, would further minimize potential impacts from sites included in hazardous materials databases by undertaking the study necessary to characterize the hazard and the engineering controls and management practices necessary to avoid the hazard.

Significant Effect: HAZ-6 - Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Construction activities at grade crossings could potentially interfere with an adopted emergency response plan or emergency evacuation plan by increasing traffic congestion and vehicle wait time. As discussed in Section 3.14, *Transportation and Traffic*, of the FEIR the PCEP would result in significant increases in traffic delays at a number of at-grade crossings along the Peninsula corridor due to increased gate-down time during peak hours, as well as impacts on traffic near some of the Caltrain stations.

The following measure mitigates this impact to a less than significant level.

- TRA-1a: Implement construction road Traffic Control Plan

During project construction, implementation of a Traffic Control Plan (Mitigation Measure TRA-1a) discussed in Section 3.14, *Transportation and Traffic*, would minimize obstructions at crossings, which would help to ensure continued emergency access to the various TPF project sites and nearby properties.

The traffic plans would include construction truck marshaling to prevent construction traffic congestion to and from the project sites.

Emergency response times are a function of the conditions between the responder base location and the incident location overall, not only a function of conditions at any one point along the response path. As discussed in Section 3.14, *Transportation and Traffic*, if the FEIR the PCEP would substantially reduce overall vehicle miles traveled in the Peninsula corridor, which would improve congestion on a broad general basis. Most of the vehicle miles traveled reductions would be during peak hours, which is especially important in reducing congestion. This broad-based congestion improvement (approximately 235,000 miles per day in 2020 and 619,000 miles per day in 2040, compared with No Project Conditions) is expected to more than offset the localized effects on at-grade crossings and near Caltrain stations and result in a net improvement (compared with No Project Conditions) in the emergency response times and in the ability to evacuate constrained areas by vehicle.

Significant Effect: CUMUL-8-HAZ - Cumulative effects related to hazards and hazardous materials

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: During construction of cumulative projects, people could be exposed to a risk to human health and spillage of hazardous materials such as gasoline, oil paint and solvents could. Water quality contamination could occur from accidental spillage of hazardous materials and mixture of contaminated water with non-contaminated water. Excavation activities could expose construction crew members to hazardous materials that could pose a risk to health and safety.

During cumulative project construction, there may be temporary obstruction of access and egress from construction sites and on adjacent roads due to construction. Such obstruction would affect the ability of emergency responders to timely reach their destinations and impede the ability to evacuate constrained areas in the event of an emergency. Where one or more cumulative projects would be in construction at the same time in the same area, there could be cumulative impacts on emergency response or evacuation capacity.

Release of and exposure to hazardous materials during operation of cumulative projects could result in a cumulative significant impact. Because both HSR service and the PCEP would involve electrically powered trains, spills of diesel petroleum products would not occur during operation. However, operation of HSR service and the PCEP would involve handling of hazardous materials including batteries in EMUs, fluids in transformers and other electrical equipment, and maintenance materials and cleaning fluids.

Operation of the other cumulative projects would also involve the use and handlings of petroleum and other hazardous materials including during maintenance.

The following measures mitigate this impact to a less than significant level.

- HAZ-2a: Conduct a Phase II Environmental Site Assessment prior to construction
- HAZ-2b: Implement engineering controls and best management practices during construction
- TRA-1a: Implement construction road Traffic Control Plan

Compliance with local, state and federal regulations for handling of materials and implementation of the mandatory Stormwater Pollution prevention Plan will address impacts associated with construction handling of petroleum and other materials. For encountered contamination, the PCEP would require implementation of Mitigation Measures HAZ-2a and HAZ-2b, which require preconstruction investigation of potentially contaminated areas and appropriate containment, handling and disposal of any encountered contaminated soil and groundwater. Thus, the PCEP's contribution to any potential cumulative impact related to hazardous materials during construction would be reduced to a less-than-considerable level.

As discussed in Section 3.8, *Hazards and Hazardous Materials*, of the FEIR the PCEP could have such effects if an emergency occurs at the time when the PCEP construction limits access to the Caltrain right of way or at at-grade crossings. As described in Section 3.14, *Transportation and Traffic*, of the FEIR Mitigation Measure TRA-1a will require the preparation of a traffic control plan to help ensure continued emergency access to Caltrain right of way, at-grade crossings, and all nearby properties. Caltrain would coordinate with local public works departments, local emergency providers, and Caltrans in the development of the traffic control plan to specifically address emergency response concerns. Potential issues associated with multiple projects in construction at the same time may be addressed through development of the traffic control plan. Thus, with mitigation, the PCEP's contribution to a potential cumulative impact related to emergency response or evacuation would be less than considerable.

The operational use and handling of hazardous materials is highly regulated by local, state, and federal requirements that are applicable universally. Therefore, routine operation and maintenance of the cumulative projects is not likely to have a significant cumulative impact from the release of or exposure to hazardous materials. There is always the possibility of an unforeseen accident involving petroleum or other hazardous materials, but local, state, and federal regulations also specify operating procedures to minimize the potential for such accidents and remedial response necessary in the event of such accidents or spills to contain and cleanup hazardous material releases.

Hydrology and Water Quality

Significant Effect: HYD-1a - Violate any water quality standards or WDRs, or otherwise substantially degrade water quality

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Construction grading and utility excavations at proposed TPF sites could result in a short-term increase in the sediment load in stormwater during rainfall events. Installation of OCS poles would require soil excavation, which would potentially result in substantial soil disturbance, and could also increase sediment loads into nearby waterways. Additional sediment sources created during construction include soil stockpiles and soil tracked across construction areas, debris resulting from the installation of OCS pole foundations, erosion in areas where vegetation is cleared for OCS pole and catenary system placement, and soil transported by wind (from dry, exposed excavated areas). Although sediment from erosion is the pollutant most frequently associated with construction activity, other pollutants of concern are toxic chemicals from heavy equipment or construction-related materials.

The following measure mitigates this impact to a less than significant level.

- HYD-1: Implement construction dewatering treatment, if necessary

Because the PCEP would disturb more than 1 acre of land, a SWPPP would be required as part of compliance with the NPDES Construction General Permit. The purpose of a SWPPP is to reduce the amount of construction-related pollutants that are transported by stormwater runoff to surface waters. The SWPPP would emphasize standard temporary erosion control measures to reduce sedimentation and turbidity of surface runoff from disturbed areas with the project area and other best management practices to prevent and minimize the potential for other pollutants of concern to enter waterways. As discussed in Section 3.9, *Hydrology and Water Quality* of the FEIR, use of non-potable water (i.e., from wastewater reclamation facilities and permitted groundwater wells) for dust control would not present a health or safety hazard if used in accordance with applicable State Department of Health, State Water Resources Control Board, Regional Water Quality Control Board, and City Departments of Health and Public Works orders, standards and regulations.

Construction dewatering in areas of shallow groundwater could be required during excavation required to install OCS poles and possibly during utility relocations and installation. In the event groundwater is encountered during construction, dewatering would be conducted according to methods and performance standard described in Mitigation Measure HYD-1. Coverage under the Construction General Permit typically includes dewatering activities as authorized non-stormwater discharges provided that dischargers prove the quality of water to be sufficient and not affect beneficial uses. However, the San Francisco Bay Regional Water Quality Control Board will need to be notified if dewatering will occur and the contractor may be subject to dewatering requirements in addition to what's outlined in the Construction General Permit, including discharge sampling and reporting.

Significant Effect: HYD-2 - Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: As the OCS poles would have foundations 15 to 20 feet below ground surface (bgs), groundwater would be encountered in areas where the groundwater table is less than 15 feet bgs. In addition, utility relocation and installation may also encounter shallow groundwater. Shallow groundwater may be encountered in the vicinity of San Francisco Bay in San Francisco, San Mateo, and Santa Clara Counties. Impacts on groundwater would be limited to areas with high groundwater tables where construction-related dewatering would occur on a temporary, short-term (during construction) basis. There would also be potential to encounter groundwater during excavation in areas where depth to groundwater is unknown. In the event groundwater is encountered during construction, temporary dewatering would be conducted locally.

The following measure mitigates this impact to a less than significant level.

- HYD-1: Implement construction dewatering treatment, if necessary

Given the limited area of construction activity associated with the OCS foundation augering and potential utility relocations/installations, potential groundwater dewatering volumes would be limited and, thus, the PCEP would not substantially deplete groundwater supplies. In addition, groundwater within the project area is not a large source of water supply, one reason which is that much of it is saline due to the proximity to the San Francisco Bay. The PCEP would comply with the Construction General Permit and other related requirements, and, if dewatering is necessary, would also implement the methods and performance standard described Mitigation Measure HYD-1. Provided that the water is of sufficient

quality or can be treated on-site, this measure will require water to be discharged to the storm drain system or other water bodies and thereby kept within the local groundwater basin.

Significant Effect: HYD-4 - Place housing within a 100-year flood hazard area, or place structures that would impede or redirect flood flows within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or FIRM or other flood hazard delineation map

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Overall, potential significant impacts are only expected at the TPFs located within 100-year floodplains.

As discussed in Section 3.9, *Hydrology and Water Quality* of the FEIR, PS3 Option 1 is located in a part of Burlingame subject to flooding, likely because of backwater effects from Mills Creek and/or Easton Creek which are located north of PS3 Option 1. PS3 Option 1 would be located about 1,000 feet south of Easton Creek and 2,500 feet south of Mills Creek. Easton Creek is deficient in capacity and results in flooding of residential and industrial areas during a moderate rainstorm and medium to high tides. Mills Creek experiences frequent flooding during moderate rain storms due to undersized box culverts under Rollins Road and U.S. Highway 101. In addition, the low elevation of the Mills Creek embankment causes overtopping of the creek during moderate rain storm events. The PS3 area is within the southern edge of the inundation area along the Caltrain right of way due to these two creeks and thus would not redirect flood flows. PS3 Option 1 would be approximately 40 feet by 80 feet (3,200 square feet, or <0.1 acre) and would be located in a previously cleared and graded area. As a result, the amount of infiltration at PS3 Option 1 is likely minimal. Given the small size of PS3 Option 1, and its location on the edge of the inundation zone on a previously graded area with limited existing infiltration, it is considered unlikely that PS3 Option 1 would contribute significantly to flooding.

PS6 (both options) is located in an area shown as within the current 100-year floodplain. The area of flooding is shown as an elongated area of flooding along the Caltrain right of way itself. PS6 (Option 2) is located in an existing paved area; placement at this location would have no impact on flooding. PS6 (Option 1) is located in an unpaved area and thus, as discussed above for PS3, the addition of a small amount of impervious space is unlikely to contribute significantly to flooding, but Mitigation Measure HYD-4 would apply to the PS6 (Option 2) location to minimize the potential to contribute to flooding.

TPS2, Option 3 would be located at CEMOF in an area that is partially a parking lot and partially a graded dirt lot that is surrounded entirely by developed buildings and pavement. Flooding in this area appears to be local flooding, possibly due to a lack of adequate drainage to the Guadalupe River or issues with the Howard Street outfall (the river is approximately 1,500 feet to the east of the potential TPS2 location). TPS2, Option 3 would be approximately 150 feet by 200 feet (30,000 square feet, or 0.7 acre) and would be located in a previously cleared and graded and partially paved area. As a result, the amount of infiltration at this potential location for TPS2 is likely minimal. In addition, as a backwater area, TPS2 would not redirect or block flood flows. Nevertheless, the increase in impervious space could contribute to expanded localized flooding. Mitigation Measure HYD-4 would apply to this location in order to minimize the potential to contribute to flooding potential.

The following measure mitigates this impact to a less than significant level.

- HYD-4: Minimize floodplain impacts by minimizing new impervious areas for new TPFs or relocating these facilities

Mitigation Measure HYD-4 contains site-specific performance standards that would reduce impacts at these locations to a less-than-significant level by further reducing the potential of these TPFs to contribute to localized flooding. Mitigation Measure HYD-4 is also recommended at TPFs not located within 100-year floodplains to minimize downstream flooding impacts, but is not required due to less- than-significant impacts relative to impacts on downstream flooding for these locations.

Significant Effect: HYD-5: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Several of the new TPFs are proposed within 100-year floodplains. Given the electrical equipment contained in new paralleling stations and traction power substations, flooding would pose electrical safety risks to these facilities and to any people near the facilities if flooding were to contact energized equipment.

Numerous levees are located along the San Francisco Bay shoreline and along certain creeks to protect various residential, commercial and industrial areas from coastal and riverine flooding. Levees can fail due to earthquakes or storm events, if not properly maintained or reinforced to withstand potential stresses. In the event of levee failure, there could be flooding of several areas of the existing Caltrain alignment beyond those included in the current 100-year floodplain. This existing flooding potential due to levee failure would not be changed by the Proposed Project; however, the PCEP would introduce new electrical facilities that could be damaged or result in electrical safety risks in the event of flooding.

In the event of dam failure, portions of the existing Caltrain right of way could be inundated. This existing flooding potential due to dam failure would not be changed by the PCEP; however, the PCEP would introduce new facilities that could be damaged or result in electrical safety risks in the event of flooding.

The following measure mitigates this impact to a less than significant level.

- HYD-5: Provide for electrical safety for all new TPFs subject to periodic or potential flooding

If these facilities are not relocated outside of the 100-year floodplain or at previously paved areas pursuant to options in Mitigation Measures HYD-4, then Mitigation Measure HYD-5 will provide for the safety of these new facilities by requiring Caltrain to place all new electrical equipment on elevated pads above expected flood depths and/or protect such equipment with flood barriers. If equipment cannot be designed so that flood waters cannot contact the equipment, then sealed or capped moisture-resistant components are required. In addition, Caltrain shall develop emergency response procedures to provide electrical safety including system shutdown during projected flood events.

Significant Effect: CUMUL-9-HYD: Cumulative impacts related to hydrology and water quality (excluding flooding related to sea level rise).

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to construction hydrology and water quality effects, and flooding aspects other than those related to sea level rise.

Facts in Support of Findings: The PCEP could have construction effects on water quality due to construction runoff or dewatering that could combine with cumulative projects in construction at the same time that could affect downstream cumulative water quality. Application of all state and federal

requirements for stormwater control would help to control cumulative construction effects. The PCEP also includes some TPFs located within the 100 year floodplain which, in combination with cumulative developments could affect floods and flows in watersheds affected by cumulative projects.

The following measure mitigates the PCEP's contribution to these effects to a less than considerable level.

- HYD-1: Implement construction dewatering treatment, if necessary
- HYD-4: Minimize floodplain impacts by minimizing new impervious areas for new TPFs or relocating these facilities
- HYD-5: Provide for electrical safety for all new TPFs subject to periodic or potential flooding

Mitigation Measure HYD-1, in addition to Construction NPDES requirements would limit PCEP contributions to construction period water quality effects to a less than considerable levels. Mitigation Measures HYD-4 and HYD-5 would limit PCEP contributions to cumulative flooding impacts by limiting the amount of new impervious space and by providing for facility protection for TPS subject to flooding.

Land Use and Recreation

Significant Effect: LUR-4: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: A number of parks and open spaces are located adjacent to the Caltrain right of way. Under the PCEP, vegetation clearance for safety purposes may be necessary at four park locations where the electrical safety zone would extend outside the current Caltrain right of way and one location where the park is partially on the Caltrain right of way. This vegetation removal could have an effect on park uses, park lands and park aesthetics.

Operationally, the PCEP would only potentially adversely affect adjacent parks in relation to aesthetics and vegetation maintenance. PS7 would be adjacent to Kurte Park in San Jose. At this location, the prevailing views northward from the park are of the grasslands on Communications Hill, a few scattered trees and the railroad right of way. Although the PS7 facility would be small (40 by 80 feet), it would be an anomalous industrial facility in a view largely dominated by grassland features As discussed in Section 3.1, *Aesthetics* of the FEIR this is considered a significant aesthetic impact.

As discussed above, vegetation maintenance inside the Caltrain right of way is an existing activity. While the area of vegetation maintenance would move outward to the edge of the right of way, after initial vegetation removal for construction, the maintenance activity should be roughly similar to existing vegetation maintenance. Thus, temporary noise of vegetation maintenance inside the Caltrain right of way would have less-than-significant impacts on adjacent or nearby parks. Where vegetation maintenance is required within the electrical safety zone in the four parks described above, it would be more intrusive than vegetation maintenance than on the Caltrain right of way itself. Because the areas of maintenance would be outside the areas of active park use and maintenance would occur for a limited period of time in any one year, vegetation maintenance would have a less-than-significant impact on park lands and park uses.

The following measure mitigates this impact to a less than significant level.

- BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan
- AES-2b: Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers

Mitigation Measure BIO-5 would require replacement of any removed trees, and it is feasible to replace the visual screening function of trees that exists today in a way that is compatible with PCEP design. Thus, with mitigation, the loss of park vegetation would be a less-than-significant impact.

Mitigation Measure AES-2b would require planting of trees between the park and PS7 to visually screen the lower portions of the new paralleling station and require aesthetic treatment to help the facility blend in with surroundings. With this mitigation, aesthetic impacts at this location would be less than significant. With Project Variant 1, PS7 would be located farther north than its current proposed location and would not be visible from Kurte Park and there are no other parks in the close vicinity to the PS7 variant locations.

Significant Effect: CUMUL-10-LUR - Cumulative effects related to land use and recreation

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Cumulative construction impact analysis focused on temporary impacts on existing land uses and recreation. Operational impact analysis addressed potential division of communities, land use policy/plan consistency, and direct/indirect changes in recreational facilities.

The following measures mitigate this impact to a less than significant level.

- BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan
- AES-2b: Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers

The PCEP would be constructed within the Caltrain right of way, with the exception of the two TPSs (except for TPS2, Option 3 which is in the right of way) and potentially for the PS7 Variant locations, limited areas where the OCS alignment would be outside the Caltrain right of way, and areas where the electrical safety zone would extend outside the Caltrain right of way and require vegetation clearance. Construction within the Caltrain right of way would not displace other land uses outside the right of way.

As discussed in Section 3.10, *Land Use and Recreation*, the TPS location options, with the exception of TPS2 Option 2 and TPS2 Option 3, are vacant parcels surrounded by industrial or commercial areas. TPS2 Option 2 would displace existing industrial use and parking currently on the site; however, there are numerous alternative locations for industrial use in the vicinity. TPS3 Option 3 would be in a parking lot/open area at the CEMOF that is used for parking and as a laydown area. The construction of the OCS poles would primarily occur within the Caltrain right of way; however, in some locations the OCS poles would be erected on adjacent commercial, industrial and residential land. Some tree removal or pruning may be necessary on areas outside the Caltrain right of way, which could disrupt existing land uses. Temporary staging and access could also result in use of vacant lots inside and outside of the Caltrain right of way, but would not result in new land uses that might be inconsistent with adjacent land uses. PS7 Variant A and B would be partially or entirely located on Caltrans-owned land, but not in any area used for active support of SR 87.

As discussed in Section 3.1, *Aesthetics* of the FEIR construction activity in residential and park areas would be anomalous, and the visual character of such areas would be partially degraded during construction. The duration of OCS construction at any one location would be limited to the time necessary to install pole foundations and then later to install poles and string wires. The change in visual character would only occur for a limited period and the perception of the visual quality of such areas would not be altered once construction is complete. To ensure that the duration of construction disruption and activities are limited in areas of greater visual sensitivity, Mitigation Measure AES-2a would be implemented to avoid using residential or park areas for access or staging areas, to minimize the duration of construction activity in such areas (to the extent feasible) and to remove all construction equipment and materials immediately following completion of construction on such sites. Because the disruption of existing land uses during construction would be temporary, would not ultimately result in a conversion of land use (except at TPS2 Option 2, for which there are ample industrial sites for the displaced use and TPS3 Option 3 for which alternative sites can be identified for parking and laydown areas within the Caltrain right of way) and because Mitigation Measure AES-2a would ensure that disruption to individual residential areas or park areas is minimal, the contribution of PCEP's construction to the cumulative significant impact on land use and recreation would be less than considerable.

As described in Section 3.10, *Land Use and Recreation* of the FEIR the PCEP would not physically divide existing communities. The OCS poles and wires would add additional infrastructure in the Caltrain right of way but would not physically impede access across the Caltrain right of way. There may be increased delays at some at-grade crossings, but the delays would be temporary and would not physically divide communities on either side of the Caltrain right of way. Thus, the contribution of the PCEP's operation to any potential cumulative impacts related to physically dividing a community would be less than considerable.

As described in Section 3.10, *Land Use and Recreation* the majority of the PCEP, including OCS poles and wires, the paralleling stations, and the switching station would be located within the existing Caltrain right of way and would, therefore, not impact adjacent land use plans. The PCEP would result in several inconsistencies with local plans and policies, specifically, at the location of TPS1 Option 2, and at locations where the OCS alignment and electrical safety zone would be outside rail or road right of way. However, the PCEP would not displace existing or potential future development (except the existing industrial/warehouse use, which can be readily absorbed at other San Jose industrial sites, at the TPS2 Option 2 site) and, thus, would not result in significant secondary environmental impacts as a result of the inconsistencies with local land use plans and policies.

At TPS1, Option 3 there is a pending hotel application under evaluation by the City of South San Francisco for which an EIR will be released in 2015. If approved and constructed, then construction of TPS1 at this location may be in conflict with the hotel, depending on the remaining developable land at the site. As described in Section 3.11, *Noise* of the FEIR there are noise impacts of locating a TPS at this site adjacent to an existing hotel but mitigation would lower the potential noise impact to less than significant. Similarly, if the new hotel is built and there were still remaining land at the site for a TPS, then the noise mitigation would still apply. If the hotel is built, the costs of land acquisition would increase, and may be a consideration for Caltrain in deciding on which potential site to locate the TPS. An additional option, Option 4 was added by Caltrain at the request of the City of South San Francisco in order to increase the options for Caltrain as Option 3 may be more conflicted in the future than in 2013 at the start of the CEQA process.

PS4, Options 1 and 2 would be located within an area envisioned for Transit Oriented Development and a Transit Center and associated improvements as part of the Hillsdale Station Area Plan. As concluded in

Section 3.10, *Land Use and Recreation* these two options would require minor reconfiguration of the plan, but would not hinder the ability to develop transit oriented development overall, provide a Transit Center, or relocate the Caltrain Hillsdale Station and thus development would not be displaced from the site. PS4, Option 3 would not require the minor reconfiguration.

SWS Option 1 would be located adjacent to, but not in an area proposed for mixed residential/commercial/light industrial use in the Redwood Triangle portion of the North Fair Oaks Community Plan. Because SWS, Option 1 is outside of the plan area, it would not displace any potential other land uses in the plan area. The mixed-use development can be fully realized within the plan area. Thus, contribution of the PCEP operation to any potential cumulative impacts related to land use policy or plan conflicts (and resultant secondary physical impacts on the environment) would be less than considerable.

Where Blended Service passing tracks are proposed outside the Caltrain right of way, they could affect park or open space directly adjacent the Caltrain right of way. Based on Table 3.10-2 in Section 3.10, *Land Use and Recreation* of the FEIR all of the five preliminarily identified passing track locations would be adjacent to parks. The design of passing tracks is unknown and, thus, no definitive conclusion can be made about whether any parks would actually be affected or not. However, pursuant to the mandatory requirements of Section 4(f) of the Department of Transportation Act of 1966, CHSRA will first consider options for avoiding park impacts in design of any passing tracks. If park impacts cannot be avoided, then Section 4(f) requires mitigation to provide additional park space so that no overall loss of park space and recreational opportunities results.

As described in Section 3.10, *Land Use and Recreation* of the FEIR the PCEP may require tree removal at Broadway-Arguello Park (Redwood City), Holbrook-Palmer Park (Atherton) and at Peers Park (Palo Alto). Mitigation Measure BIO-5 requires replacement of removed trees and, as discussed in Section 3.10, *Land Use and Recreation*, it is feasible to replace trees removed at parks at the parks themselves to maintain their visual screening function from the Caltrain right of way without loss of substantial portions of the parks. Given that Blended Service improvements or other cumulative transportation projects would be required to avoid and/or mitigate for park impacts per the Section 4(f) requirements, other cumulative projects are unlikely to affect parks, and the PCEP's park impacts would be mitigated, cumulative impacts are likely to be mitigable to a less than significant level. Given the project-level mitigation described above, the PCEP's contribution to any potential cumulative impacts would be less than considerable with mitigation.

Noise and Vibration

Significant Effect: NOI-1b: Expose sensitive receptors to substantial increase in noise during operation

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Operational train noise impacts would include both a decrease in train noise, because EMUs are quieter than corresponding diesel locomotives, and an increase in train noise, primarily during peak hours due to the Proposed Project's increase in Caltrain service.

In addition to the noise generated by the proposed Caltrain passenger rail operations, the electrical traction power substations and ancillary facilities would generate stationary noise. Operational noise levels were calculated in order to predict the total PCEP noise levels with the ambient noise at the

receptors, accounting for both changes resulting from EMU train operations (where TPFs are located near the Caltrain right of way) and the new ancillary facility stationary noise sources.

Before mitigation, the noise analysis results indicate that the operation of TPS1 Option 3 and PS5, Option 2 would result in an increase in ambient noise levels exceeding FTA moderate impact criteria at noise sensitive receptors.

The following measure mitigates this impact to a less than significant level.

- NOI-1b: Conduct site-specific acoustical analysis of ancillary facilities based on the final mechanical equipment and site design and implement noise control treatments where required

Operational train noise impacts would include both a decrease in train noise, because EMUs are quieter than corresponding diesel locomotives, and an increase in train noise, primarily during peak hours due to the PCEP's increase in Caltrain service. As shown in Table 3.11-15 of the FEIR, there are no study locations where noise increase would exceed the FTA moderate impact or severe impact level. Therefore, PCEP operations would have a less-than-significant impact along the Caltrain corridor.

Implementation of Mitigation Measure NOI-1b, would reduce the impacts related to one TPF facility (TPS1, Option 3) and one PS facility (PS5, Option 2) to a less-than-significant level through compliance with specific performance criteria, site design treatments, and or equipment reconfiguration/relocation that would reduce noise below thresholds levels.

Significant Effect: NOI-2a: Expose sensitive receptors to substantial increase in ground-borne vibration levels from proposed operations

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Given that the closest structures are less than 25 feet from the Caltrain right of way, it is possible that construction activities involving vibratory hammer or vibratory compactor/roller operations occurring at the edge of or slightly outside of the current right of way could result in vibration damage. If vibratory pile piling is conducted less than 25 feet from buildings or vibratory rolling/compacting conducted less than 15 feet from buildings, then damage from construction vibration may occur which would be a significant impact. A particular area of concern would be pile driving near historic station structures along the Caltrain right of way.

The following measure mitigates this impact to a less than significant level.

- NOI-2a: Implement Construction Vibration Control Plan

With implementation of Mitigation Measure NOI-2a, vibration impacts would be avoided or minimized. If building damage does occur due to construction, then repairs would be made or compensation provided.

Residents and other sensitive receptors located within the annoyance distances identified in Table 3.11-17 of the FEIR could be significantly annoyed due to construction vibration. The effect would be more acute with equipment with high vibration potential, such as vibratory hammers or vibratory compactor/rollers. Mitigation Measure NOI-2a would result in the use of alternative construction techniques or timing when in proximity to residences and other sensitive receptors, thereby avoiding this impact.

Significant Effect: CUMUL-11-NOI - Cumulative increase in noise or vibration

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Cumulative vibration impacts from construction would primarily result from simultaneous construction of different projects in the same location at the same time; however where construction occurs in quick succession in the same area, there could also be a cumulative impact due to the extended duration of construction disruption. Cumulative operational vibration effects would occur due to the increase in the number or vibration events along the project corridor due to the combined increases in passenger and freight rail transit through the corridor.

The following measures mitigate this impact to a less than considerable level.

Construction

- NOI-2a: Implement Construction Vibration Control Plan

Operation

- NOI-CUMUL-2: Conduct project-level vibration analysis for Blended System operations and implement vibration reduction measures as necessary and appropriate for the Caltrain corridor

Mitigation Measure NOI-2a will avoid substantial vibration impacts from the PCEP during construction. Given this mitigation and the fact that vibration levels due not accumulate (like noise levels can) the PCEP would not contribute considerably to cumulative construction vibration impacts.

Mitigation Measure NOI-CUMUL-2 includes a range of feasible options, including any pertinent measures identified in Table 4-14 in the FEIR, to reduce the cumulative vibration impacts from cumulative operations. Thus, Mitigation Measure NOI-CUMUL-2 would reduce the PCEP's contribution to a less-than-significant level.

Public Services and Utilities

Significant Effect: PSU-2 - Exceed wastewater treatment requirements of the applicable Regional Water Board

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The PCEP would potentially generate substantial amounts of wastewater during dewatering activities during sub-grade excavation for OCS pole installation and excavation for electrical ductbank installation or utility relocations.

The following measure mitigates this impact to a less than significant level.

- HYD-1: Implement construction dewatering treatment, if necessary

Mitigation Measure HYD-1 requires treatment to receiving water quality standards, including those of any receiving wastewater system. This will reduce the impact to a less-than-significant level.

Significant Effect: PSU-8 - Construction activities would result in a substantial disruption to utility service systems

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Known existing utilities within the Caltrain right of way and around TPFs are identified in Tables 3.13-2 and 3.13-3 of the FEIR. Constructing OCS pole foundations, overhead facilities, TPSs, the switching station, and paralleling stations would have the potential to encroach upon existing overhead utilities and utilities that run underground longitudinally within or along the right of way.

The following measures mitigate this impact to a less than significant level.

- PSU-8a: Provide continuous coordination with all utility providers
- PSU-8b: Adjust OCS pole foundation locations
- PSU-8c: Schedule and notify users about potential service interruptions

The JPB would coordinate with all utility providers and local jurisdictions during the design phase of the PCEP to confirm the location of all subsurface and overhead utilities so that effective design treatments and construction procedures can be developed to avoid adverse impacts on existing utilities and prevent disruptions in service.

There is low to moderate potential for the PCEP facilities to affect underground utilities that cross the Caltrain right of way, and pole placement can generally be modified to avoid them. Underground utilities would be relocated if required to accommodate the installation of OCS and TPS equipment and facilities. Underground utilities and longitudinally running utilities would be avoided to the extent possible by design modifications.

Overhead utility conflicts would be avoided by raising the existing utility wires over OCS wires or relocating them under the tracks pursuant to federal, state and local code requirements. If relocation of overhead wires were required, a taller pole would be installed. Pursuant to CPUC General Order 95 and other CPUC requirements, adequate separation and clearance would be provided between the new OCS facilities and other overhead electrical overhead transmission facilities where overhead utilities can be accommodated. Some overhead utility crossings will have to be relocated underground. If relocation underground is required, the overhead wires will be removed once the underground service is established. In most cases, the JPB has reserved the right to have utilities relocated if they interfere or conflict with planned railroad facilities. In the event that a longitudinal or transverse utility line is in conflict with a proposed electrification facility, the utility owner would be requested to relocate it. If the responsibility for utility relocations lies with the JPB, then the utility relocation would be included as part of PCEP construction.

The JPB will give each utility owner advance warning of the PCEP to provide time to plan for relocation to minimize disruptions. No interference with existing utility service is anticipated during installation of connections to existing high-voltage power transmission facilities because the utility would put customer loads on alternate feeders during the connection activity.

In addition to the above PCEP provisions, Mitigation Measure PSU-8a would require that the JPB continuously coordinate with utility providers from preliminary engineering through final construction to

ensure that potential conflicts are identified and disruption is minimized. As prescribed in Mitigation Measure PSU-8b, if unanticipated underground utilities are discovered, OCS pole foundations will be adjusted to avoid them. Additionally, Mitigation Measure PSU-8c would require that any short-term, limited service interruptions would be scheduled well in advance and appropriate notification provided to users.

Significant Effect: PSU-9 - Construction activities would result in the construction of new utility facilities or expansion of existing utility facilities, the construction of which could cause significant environmental effects

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Certain utilities crossing the right of way at the locations of the two TPSs, along the ductbank connections from the TPSs to the Caltrain right of way or along the route of electrical connections between the PG&E substations and the TPSs may need to be relocated. There would also be potential impacts due to the installation of transmission lines from PG&E to the TPSs. In addition, increased electrical demand of the PCEP could require PG&E to install additional facilities.

The following measure mitigates this impact to a less than significant level.

- PSU-9: Require application of relevant construction mitigation measures to utility relocation and transmission line construction by others

Mitigation for utility line relocations is available to reduce construction period impacts to a less-than-significant level. Where the JPB is responsible for the utility relocation, relocation is considered part of the PCEP and all mitigation applicable to the PCEP would apply to JPB-initiated utility relocations. Utility owners will in most cases be the responsible party for completing the utility relocation. In those instances and pursuant to Mitigation Measure PSU-9, the JPB will require the same construction mitigation measures identified in the FEIR for OCS construction to be applied to utility relocation efforts by the utility owner within the Caltrain right of way or on Caltrain owned property. Outside the right of way, the JPB would recommend the mitigation measures to the relevant city or county jurisdiction in their permitting for the relocation effort.

Relocation of existing underground utilities is a low-order probability, but may occur. For any underground utility relocations that may be necessary, the construction activity would involve excavation and removal of the existing underground facility and placement of the utility in an alternative alignment compatible with PCEP features. Temporary construction impacts would be associated with air quality, noise, soil disturbance, potential dewatering, and traffic and can also be addresses through the construction mitigation measures identified in the PCEP's FEIR and pursuant to Mitigation Measure PSU-9, the JPB will require their application within the Caltrain right of way (and recommend them for use outside the right of way).

PG&E will be requested to provide power connections from its existing substations to the two proposed TPSs. All the potential TPS sites are located relatively close to their source PG&E substation. Construction impacts for new overhead lines would be similar to the construction impacts described throughout the PCEP's FEIR for OCS installation and would include temporary air quality, noise, soil disturbance, and traffic effects, but the effects would be limited to the area of the overhead line itself. Temporary construction impacts for underground ductbank installation would be associated with air quality, noise, soil disturbance, potential dewatering, and traffic. In both cases, construction impacts will be addresses through the construction mitigation measures identified in the PCEP's FEIR, and, pursuant

to Mitigation Measure PSU-9, the JPB will require their application for construction within the Caltrain right of way and recommend them for use by PG&E outside the right of way.

Under the PCEP, use of EMUs for approximately 75 percent of Caltrain's fleet for service between San Francisco and San Jose would increase electricity demand. As described in FEIR Section 2.3.7.3, *Energy Consumption*, Section 4.5, *Energy*, and Impact PSU-9 in Section 3.13, there does not appear to be any need for additional PG&E transmission line facilities upstream of the PG&E substations that would connect to the TPSs.

Significant Effect: CUMUL-13-PSU - Cumulative impacts related to public services and utilities

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: During construction, cumulative projects could disrupt utility service systems in a planned or unplanned manner. Standard construction practices and regulations require construction contractors to identify and avoid unplanned disruptions to utilities and to work with utility owners to coordinate construction to avoid damage and utility outages. However, there would remain a small potential for multiple utility disruptions due to construction activities resultant from cumulative projects that occur at the same time.

Construction of the cumulative projects would generate solid waste. Construction waste would include soils from grading and excavating activities, construction and demolition material, and other solid waste. Cumulative growth in the region will also result in increased solid waste generation.

Operation of cumulative projects could increase demands for additional utility infrastructure including water supply, electrical supply and natural gas supply. New transportation projects, including Blended Service, BART Silicon Valley extension, and extension of light-rail systems would increase cumulative demand for electricity. Land use projects and general regional growth will increase water, electricity, and natural gas demands. The cumulative demands for utility service could result in the need for additional utility infrastructure including electricity generation plants and transmission facilities, development of additional water supplies and distribution infrastructure as well as additional natural gas supply and transmission. Depending on where the new infrastructure is required, this could result in significant impacts on the environment during construction of such new facilities.

The following measure mitigates this impact to a less than significant level.

- PSU-8a: Provide continuous coordination with all utility providers
- PSU-8b: Adjust OCS pole foundation locations
- PSU-8c: Schedule and notify users about potential service interruptions
- PSU-9: Require application of relevant construction mitigation measures to utility relocation and transmission line construction by other

As discussed in Section 3.13, *Public Services and Utilities* of the FEIR earth moving activities for the installation of the OCS poles, and TPFs could temporarily disrupt utility service systems. However, with the implementation of Mitigation Measures PSU-8a, PSU-8b, and PSU-8c, which require JPB coordination with all utility providers, adjustment of OCS pole locations (as necessary to minimize utility conflicts), and scheduling and notification requirements, the PCEP would minimize potential disruptions

to utilities and thus would make a less than considerable contribution to any potential cumulative impacts during construction.

As described in Section 3.13, *Public Service and Utilities* of the FEIR the only solid waste expected to result from project construction would be soil resulting from grading and excavation associated with construction of TPFs and OCS foundations as well as general packaging and other materials associated with construction materials and construction workers. Any uncontaminated soil that is not reused onsite would be recycled in accordance with the various state and local ordinances governing recycling. Contaminated soil would be disposed at facilities approved to receive such soil, as discussed in Section 3.8, *Hazards and Hazardous Materials* of the FEIR. While there are long-term concerns for landfill capacity by 2040, as explained in the EIR for *Plan Bay Area*, 12 of the current 17 major landfills in the Bay Area will still be open through 2020, including the Guadalupe Sanitary landfill and Kirby Canyon Landfill (both in Santa Clara County). Other construction waste is expected to minimal and readily handled by existing landfill facilities in the region, which have ample remaining capacity for such material in the aggregate. Thus, while long-term growth in the region will require the construction of additional landfill by 2040 to accommodate future solid waste, the Proposed Project's contribution to any cumulative impacts on landfill capacity would be less than considerable.

As discussed in Section 3.13, *Public Services and Utilities* of the FEIR the PCEP will require the relocation of some existing utilities crossing the Caltrain right of way or along the location of the ductbanks connecting the TPSs to the Caltrain right of way and will also require construction of electrical transmission connections from PG&E substations to the two TPSs. The relocation of these utilities or the construction of electrical transmission connections could result in secondary environmental impacts. Thus, the PCEP could contribute to cumulative demands for new utility infrastructure relative to the local utility relocations and the local transmission facility extensions. Under Mitigation Measure PSU-9, the JPB will work with utility owners and local jurisdictions to apply the relevant applicable mitigation identified for construction in the PCEP FEIR when conducting local utility relocations or local transmission line extensions made necessary by the PCEP. With this mitigation, the PCEP would make a less-than-considerable contribution to any potential cumulatively significant utility infrastructure demands.

As discussed in Section 3.13, *Public Services and Utilities* of the FEIR the PCEP is not expected to result in increased demand for police, fire, school, or other public facilities compared with existing conditions because the PCEP would not result in population growth and would not fundamentally change conditions of the Caltrain right of way in a way that increases demand for public services. For these reasons, the contribution of the PCEP to any potential cumulatively significant on public service demands that might result in the need for construction of additional public service facilities would be less than considerable.
As discussed in Section 3.13, *Public Services and Utilities* of the FEIR, with the PCEP, normal EMU operations would not result in substantial new generation of solid waste above that associated with the servicing of diesel locomotives today. Similarly, maintenance of the OCS and TPFs would not involve the generation of large amounts of solid waste. There would be a minor increase in solid waste production associated with the Proposed Project from increased ridership (e.g., disposable coffee cups, newspaper), but the volumes of waste would not be substantial relative to landfill capacity. Therefore, PCEP operations would result in a less-than-significant solid waste generation and would make a less-than-considerable contribution to any potential cumulatively impacts on landfill capacity.

Transportation and Traffic

Significant Effect: TRA-1a: Substantially disrupts existing or future traffic operations during construction

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The following construction activities could require temporary closures of travel lanes or road segments, which would reduce the vehicle capacity of the roadway segments, disrupt the traffic flow, and potentially increase vehicle delays on the roadway segments:

- Installation of OCS wires may require lane or road closures at at-grade crossing when the wires are installed across the roads.
- Installation of overbridge protection barriers may require one-lane closures on the side of the road the barriers are installed.
- Installation of the transmission line or underground conduit between the PG&E substations and the TPS and between the TPS and the Caltrain ROW or utility relocations may require lane or road closures when the work is conducted across public roadways.

The following measure mitigates this impact to a less than significant level.

- TRA-1a: Implement construction Road Traffic Control Plan

Implementation of Mitigation Measure TRA-1a would reduce the temporary construction impact on roadway traffic to a less-than-significant level by requiring preparation and implementation of a road traffic control plan that will include specific measures to minimize impacts on transit service, roadway operations, emergency responses, pedestrian and bicycle facilities, and public safety.

Significant Effect: TRA-2a - Disrupts existing or planned transit services or facilities during construction

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: During the construction, installation of OCS poles and wires would require the use of on-track equipment in many locations. The majority of the work could be accomplished during the nighttime using single-track access; however, some portions of the work would require some multiple track shutdowns and could only be installed by using complete weekend outages, requiring suspension of passenger service, to increase working efficiency and reduce public safety risks. Although most of the on-track work would be conducted during nighttime hours with occasional service shutdowns occurring during weekends, the construction impact on Caltrain passengers (or ACE, Capitol Corridor, or Amtrak trains between Santa Clara and San Jose) that take trains at night or on the weekend is considered significant.

In addition, construction strategies to improve construction efficiency with minimizing construction impacts are included in the PCEP as shown in Chapter 2, *Project Description*, Table 2-5, of the FEIR. Strategies that could potentially disrupt Caltrain service and affect Caltrain passengers and the connecting transit services include revising the Caltrain schedule, reducing the span of Caltrain's service day, reducing the number of trains, shutting down service for specific weekends, and closing a station temporarily during construction. Although specific strategies have yet been determined, any of the strategies, if selected, would result in temporary significant impacts on Caltrain passengers and the connecting transit services.

The following measures mitigate this impact to a less than significant level.

- TRA-1a: Implement construction road Traffic Control Plan
- TRA-2a: Implement railway disruption control plan

Implementation of Mitigation Measure TRA-2a would reduce the temporary construction impact on rail passenger and freight service disruption to a less-than-significant level by minimizing the duration of potential disruption to service during construction. This measure requires Caltrain, among other things, to:

- Limit number of simultaneous track closures within each immediate vicinity, with closure time frame limited as much as feasible for each closure, unless bypass tracks are available.
- Provide safety measures for rail services to transit through construction zones safely.
- Require contractors to coordinate with rail dispatch to minimize disruption of rail service in the corridor.
- Where feasible, limit closure of any tracks for construction activities to off-peak periods and weekends, when service is less frequent or late night, when no passenger service is scheduled.
- Where feasible, maintain acceptable service access for passenger and freight service.
- Where one open track cannot be maintained for passenger or freight use, limit multi-track closures to one location at a time, as much as feasible
- Where multi-track closures result in temporary elimination of transit rail service, work with local and regional transit providers to provide alternative transit service around the closure area including increased bus and shuttle service.
- Where multi-track closures result in temporary elimination of freight rail service, work with Union Pacific and freight users to schedule alternative freight service timing to minimize disruption to freight customers.
- Provide advance notice of all construction-related track closures to all affected parties. Provide advance notice to transit riders of any temporary disruption in transit service.
- Where temporary cessation of freight rail service is necessary due to multi-track closures and would result in substantial diversion to truck modes, Caltrain or its construction contractor shall coordinate with local jurisdictions and freight operations to determine preferred truck routes to minimize the effect on local traffic conditions.
- Construction in and adjacent to BART facilities will be coordinated in advance and during construction with BART including any necessary BART safety monitors. If construction would result in any potential service disruption, Caltrain or its construction contractor shall coordinate with BART to avoid the disruption and/or minimize the extent and duration of disruption and provide information to commuters on alternative transit options during the disruption.
- Caltrain and/or its construction contractor shall coordinate with Union Pacific in advance and during any potential disruption to freight operations and/or Union Pacific facilities. Union Pacific's emergency access will be maintained throughout construction.

Construction impact on roadway transit services could be potentially significant when temporary lane or road closures are required on roadway segments, bridges, and at-grade crossings that are used by transit services. Implementation of Mitigation Measure TRA-1a would reduce the temporary construction impact on roadway transit services to a less-than-significant level by ensuring access through the work zones.

Significant Effect: TRA-3a - Disrupts existing or planned pedestrian facilities during construction

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Construction impact on pedestrian facilities related to closure of at-grade crossings when installing OCS infrastructure or when relocating utilities could be significant when temporary sidewalk or walking path closure is required.

The following measure mitigates this impact to a less than significant level.

- TRA-1a: Implement construction road Traffic Control Plan

Mitigation Measure TRA-1a would reduce the temporary construction impact to a less-than-significant level through the following requirements:

- Provide advance notice of all construction-related street closures, durations, and detours to local jurisdictions, emergency service providers, and motorists.
- Provide safety measures for vehicles, bicyclists and pedestrians to transit through construction zones safely.
- Limit sidewalk, bicycle, and pedestrian walkway closures to one location within each vicinity at a time, with a closure time frame limited as much as feasible for each closure unless alternative routings for pedestrian and bicycle transit are available.

Significant Effect: TRA-3b - Disrupts existing pedestrian facilities, interferes with planned pedestrian facilities, or conflicts or creates inconsistencies with adopted pedestrian system plans, guidelines, policies, or standards from Proposed Project operations

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Increased ridership under the PCEP would cause increased pedestrian volumes at pedestrian facilities surrounding Caltrain stations. The existing facilities are capable of accommodating increased pedestrian volumes at all stations with the exception of the Fourth and King Station in San Francisco. The PCEP would contribute to increased pedestrian activity from 2020 until DTX/TTC infrastructure is completed and trains are routed through the Fourth and King Station.

The following measure mitigates this impact to a less than significant level.

- TRA-3b: In cooperation with the City and County of San Francisco, implement surface pedestrian facility improvements to address the Proposed Project's additional pedestrian movements at and immediately adjacent to the San Francisco 4th and King Station

Pedestrian facility flow and safety improvements will be implemented pursuant to Mitigation Measure TR-3b to allow the orderly movement of pedestrians, bicyclists, private vehicles, buses, and shuttles around the Fourth and King Station. This measure will commit the JPB to cooperating with the City and County of San Francisco in preparing a pedestrian access study for the station and the JPB to implementing its fair share of pedestrian improvements as recommended by the study. In addition, the measure identifies the following potential surface improvements to pedestrian facilities:

- Widened curb waiting areas and added pedestrian bulbouts where high levels of demand cannot be accommodated by existing facilities.
- A pedestrian "scramble" at the intersection of 4th and Townsend Streets. A pedestrian scramble is an intersection that is striped and designed to allow pedestrians to cross diagonally in all directions during an all-way red signal at which all motor vehicles are stopped.
- Signalization improvements for both 4th and Townsend and 4th and King intersections. While a pedestrian scramble is not likely to be feasible at the intersection of 4th Street and King Street due intersection size, traffic volumes, and SMFTA at-grade transit operations, all-way pedestrian signals at existing crosswalks are potentially feasible.
- Widened crosswalks to increase pedestrian volumes and improve pedestrian sidewalk widths on the immediate approaches to the intersections of 4th and Townsend and 4th and King Streets, as appropriate and feasible.
- Pedestrian safety countermeasures, such as pedestrian barriers and improved signage, as necessary to address safety issues that are directly related to increased pedestrian volumes at station access points.

Significant Effect: TRA-4a - Substantially disrupts existing bicycle facilities or interferes with planned bicycle facilities during construction

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Construction impact would be significant on bicycle facilities when temporary shoulder or road closures are required on roadway segments, bridges, and at-grade crossings with bicycle lanes or high bicycle traffic.

The following measure mitigates this impact to a less than significant level.

- TRA-1a: Implement construction road Traffic Control Plan

Implementation of Mitigation Measure TRA-1a would reduce the temporary construction impact to a less-than-significant level through the following requirements:

- Limit number of simultaneous street closures and consequent detours of transit and vehicular traffic within each immediate vicinity, with closure time frame limited as much as feasible for each closure, unless alternative traffic routings are available.
- Provide advance notice of all construction-related street closures, durations, and detours to local jurisdictions, emergency service providers, and motorists.
- Provide safety measures for vehicles, bicyclists and pedestrians to transit through construction zones safely.
- Limit sidewalk, bicycle, and pedestrian walkway closures to one location within each vicinity at a time, with a closure time frame limited as much as feasible for each closure unless alternative routings for pedestrian and bicycle transit are available.

Significant Effect: TRA-4b - Substantially disrupts existing bicycle facilities or interferes with planned bicycle facilities; or conflicts or creates substantial inconsistencies with adopted bicycle system plans from Proposed Project operations

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The PCEP may increase future demand for bicycle facilities however, most plans in the study area account for increased bicycle volumes through added bicycle infrastructure.

The following measure mitigates this impact to a less than significant level.

- TRA-4b: Continue to improve bicycle facilities at Caltrain stations and partner with bike share programs where available, using the guidance in the Caltrain's Bicycle Access and Parking Plan

Mitigation Measure TRA-4b would require Caltrain to continue implementation of its current planning improve bicycle facilities at Caltrain stations using the guidance provided in Caltrain's *Bicycle Access and Parking Plan.* Over time, Caltrain will use these guidelines to meet potential increased demand for such facilities.

Significant Effect: TRA-5a - Results in inadequate emergency vehicle circulation and/or access

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: The PCEP could have a temporary impact on emergency vehicle access if an emergency occurs at the time when project construction requires temporary access or egress limitations.

The following measure mitigates this impact to a less than significant level.

- TRA-1a: Implement construction road Traffic Control Plan

Mitigation Measure TRA-1a will require the preparation of a traffic control plan to help ensure continued emergency access to Caltrain right of way, at-grade crossings, and all nearby properties. Caltrain will coordinate with local public works department, local emergency providers, and Caltrans in the development of the traffic control plan to specifically address emergency response concerns.

Significant Effect: TRA-7a - Results in a change in freight rail service such that resultant diversions to truck or other freight modes would result in significant secondary impacts during construction

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings: Installation of OCS poles and wires would require the use of on-track equipment in many locations. Work could be accomplished during the nighttime using single-track access in many cases. However, some portions of the work would likely require some multiple track shutdowns at night which could result in temporary suspension of freight service in constrained areas.

The following measure mitigates this impact to a less than significant level.

- TRA-2a: Implement railway disruption control plan

Mitigation Measure TRA-2a would reduce the temporary construction impact on freight service disruption to a less-than-significant level by minimizing the duration of potential disruption. The measure includes the following specific provisions to minimize freight service disruption:

- Limit number of simultaneous track closures within each immediate vicinity, with closure time frame limited as much as feasible for each closure, unless bypass tracks are available.
- Provide safety measures for rail services to transit through construction zones safely.
- Require contractors to coordinate with rail dispatch to minimize disruption of rail service in the corridor.
- Where feasible, limit closure of any tracks for construction activities to off-peak periods and weekends, when service is less frequent or late night, when no passenger service is scheduled.
- Where feasible, maintain acceptable service access for passenger and freight service.
- Where multi-track closures result in temporary elimination of freight rail service, work with Union Pacific and freight users to schedule alternative freight service timing to minimize disruption to freight customers.
- Provide advance notice of all construction-related track closures to all affected parties. Provide advance notice to transit riders of any temporary disruption in transit service.
- Where temporary cessation of freight rail service is necessary due to multi-track closures and would result in substantial diversion to truck modes, Caltrain or its construction contractor shall coordinate with local jurisdictions and freight operations to determine preferred truck routes to minimize the effect on local traffic conditions.
- Caltrain and/or its construction contractor shall coordinate with Union Pacific in advance and during any potential disruption to freight operations and/or Union Pacific facilities. Union Pacific's emergency access will be maintained throughout construction.

Significant Effect: CUMUL-14-TRA - Cumulative effects to transportation and traffic

Finding: The JPB hereby makes finding (a)(1) (described above), as required by PRC 21081 and stated in State CEQA Guidelines Section 15091, with respect to the above identified effect.

Facts in Support of Findings:

The FEIR determines that the following aspects of project impacts would contribute to cumulative transportation impacts before mitigation, each of which are discussed in turn below:

- Construction disruption of traffic, transit, or freight
    - As discussed in Section 3.14, Transportation and Traffic of the FEIR, installation of the OCS poles and construction of the TPFs would not generally disrupt existing transportation systems or transit operations except in limited circumstances. However, construction at the at-grade crossings to install OCS infrastructure and to update grade crossing warning devices would result in temporary roadway closures (as well as bike and pedestrian crossings where present).
    - Where OCS infrastructure needs to be installed at the Millbrae Station shared by Caltrain and BART or in San Francisco at 16th Street where Muni plans to install Muni OCS infrastructure for the re-routing of the 22-Fillmore Trolley Bus, there is the potential for temporary

disruption of other transit systems. There is also the potential to disrupt freight service operations during construction.

  - The PCEP could temporarily obstruct access and egress from construction sites and on adjacent roads due to construction. Such obstruction would affect the ability of emergency responders to timely reach their response destinations and/or impede the ability to evacuate constrained areas if the emergency occurs at the time when PCEP construction is temporarily limiting access to or egress from the Caltrain right of way or at at-grade crossings along the Caltrain right of way (e.g., when changing grade-crossing warning devices).

- Transit System Operations (concerning the Muni 22 Fillmore Trolley)
  - SFMTA is proposing to re-route the 22-Fillmore electric trolley bus from its current route crossing over the Caltrain right of way at 18th Street to an at-grade crossing at 16th Street. The installation of the direct current 600-volt OCS for the electric trolley bus at 16th Street creates a conflict with the proposed installation of the 25 kVA alternative current OCS as part of the PCEP.
- Pedestrian and Bicycle Facilities during operations
  - Cumulative projects could also affect pedestrian walkways and bike paths that cross the Caltrain right of way or are directly adjacent to the Caltrain right of way. Blended Service improvements would have the greatest potential to affect such facilities if passing tracks are proposed outside the Caltrain right of way. The PCEP, in combination with other cumulative projects may also increase future demand for bicycle facilities however, most plans in the project area account for increased bicycle volumes through added bicycle infrastructure.
  - However, at the San Francisco 4th and King station, the PCEP in combination with the central Subway and other transit expansion could result in exceedance of pedestrian capacity on surface accessways to the station.

The following measures mitigate these impacts to a less than considerable level.

Construction

- TRA-1a: Implement construction road Traffic Control Plan
- TRA-2a: Implement railway disruption control plan

Transit Systems

- TRA-CUMUL-2: Implement technical solution to allow electric trolley bus transit across 16th Street without OCS conflicts in cooperation with SFMTA

Pedestrian and Bicycle Facilities

- TRA-1c: Implement signal optimization and roadway geometry improvements at impacted intersections for the 2020 Project Condition
- TRA-3b: In cooperation with the City and County of San Francisco, implement surface pedestrian facility improvements to address the Proposed Project's additional pedestrian movements at and immediately adjacent to the San Francisco 4th and King Station
- TRA-4b: Continue to improve bicycle facilities at Caltrain stations and partner with bike share programs where available, using the guidance in the Caltrain's Bicycle Access and Parking Plan

Caltrain will coordinate with all affected transit operations to avoid and minimize the duration and extent of any potential disruption. With the implementation of mitigation measures identified in Section 3.14, *Transportation and Traffic* and listed above, the PCEP would minimize potential disruptions to transportation facilities and transit services. Thus, with mitigation, PCEP construction would make a less-than-considerable contribution to any potential cumulative impacts on transportation facilities and systems.

Mitigation Measure TRA-1a will require the preparation of a traffic control plan to help ensure continued emergency access to Caltrain right of way, at-grade crossings, and all nearby properties during construction. Caltrain will coordinate with local public works department, local emergency providers, and Caltrans in the development of the traffic control plan to specifically address emergency response concerns. Any potential issues associated with multiple projects in construction at the same time can be addressed in the traffic control plan. Thus, with mitigation, the PCEP's contribution to a potential cumulative impact related to emergency response or evacuation would be less than considerable.

In order to manage the conflict to allow the SFMTA project and the PCEP to both go forward, Mitigation Measure TRA-CUMUL-2 is proposed. With implementation of this mitigation, both projects would be able to proceed and provide their improved transit benefits and the PCEP would not make a considerable contribution to any conflict with SFMTA plans.

The PCEP would add increased pedestrian volume to existing pedestrian facilities due to increased ridership. The existing pedestrian facilities have been evaluated and are capable of accommodating an increase in pedestrian traffic with the exception of pedestrian facilities around the San Francisco Fourth and King Station. Future planned pedestrian facilities are designed around the PCEP's existing alignment. Planned pedestrian facilities will be constructed to accommodate Caltrain's existing alignment. Therefore the PCEP would not contribute to cumulative impacts on pedestrian facilities at locations other than the Fourth and King Station.

As discussed in Section 3.14, *Transportation and Traffic* of the FEIR, the PCEP would only contribute to this impact between when the PCEP begins operations in 2020 and when DTX/TTC becomes operational. At that point, with ridership shifting to TTC, the PCEP would no longer have a considerable contribution to pedestrian usage because the PCEP's contribution would be less than under No Project conditions. Mitigation Measure TRA-3b (discussed in Section 3.14, *Transportation and Traffic*) would require the JPB and the City and County to plan for and implement necessary pedestrian facility improvements to the Fourth and King Station and adjacent pedestrian facilities in City street rights-of-way. Implementation of this mitigation measure would reduce the PCEP's contribution to this cumulative impact to a less than significant level.

Mitigation Measure TRA-4b, in Section 3.14, *Transportation and Traffic* of the FEIR would require Caltrain to continue implementation of its current planning to improve bicycle facilities at Caltrain stations over time to meet potential increased demand for such facilities. Thus, with mitigation, the PCEP would not contribute considerably to any significant cumulative impacts on bicycle facilities.

Findings Regarding the Alternatives

As required by CEQA, a discussion of possible alternatives to the PCEP, including the No-Project Alternative, was included in the FEIR. With adoption of the PCEP, the JPB makes the following findings to support its rejection of the five alternatives. Other alternatives were considered and screened out of the

range of alternatives analyzed in the EIR for the reasons discussed in Section 5.4.3 of the FEIR, which is hereby incorporated by reference.

As noted above, Section 15091 (a)(3) of the State CEQA Guidelines describes that one of the findings that a lead agency can make concerning significant project impacts is that specific economic, legal, social, technological, or other considerations, make infeasible the project alternatives identified in the Final EIR. In the Final EIR, Chapter 5, Alternatives, the alternatives were screened for technical, logistical, and financial feasibility, but the alternatives were not evaluated for all economic, legal, social or other considerations that make up the broader definition of "feasibility" in Section 15091 (a)(3). Thus, the use of the term "infeasible" in the findings below concerning the alternatives is more expansive than reference to "feasible" in Chapter 5 of the Final EIR, which was limited to technical, logistical and financial feasibility. An alternative may have been determined to be technically, logistically, and financially "feasible" in the Final EIR and still ultimately be concluded by the JPB to meet the definition of "infeasibility" per Section 15091 (a)(3) when all considerations are taken into account. The term "infeasible" in the findings below uses the broader definition in Section 15091 (a)(3), which is consistent with case law interpreting this provision of CEQA. The determination of infeasibility "involves a balancing of various 'economic, environmental, social, and technological factors.'" (*City of Del Mar v. City of San Diego* (1982) 133 Cal.App.3d 401, 417). Where there are competing and conflicting interests to be resolved, the determination of infeasibility "is not a case of straightforward questions of legal or economic feasibility," but rather, based on policy considerations. (*Cal. Native Plant Society v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 1001-02). "[A]n alternative that is impractical or undesirable from a policy standpoint may be rejected as infeasible." (*Id*. at p. 1002, citing 2 Kostka & Zischke, Practice Under the Cal. Environmental Quality Act, (Cont.Ed.Bar 2010) section 17.29, p. 824).

No-Project Alternative

Findings: The JPB hereby finds that this alternative is ultimately rejected as infeasible for the following reasons.

Facts in Support of Findings:

The No-Project Alternative would not substantially improve increase ridership and increase service levels. This does not achieve the PCEP's objective to that effect.

The No-Project Alternative would not meet the project's objective to reduce train engine noise. The No-Project Alternative would increase noise levels at up to 41 out 49 study locations compared to the Proposed Project (FEIR, pg. 5-10). Four locations would have lower noise than existing (2013) levels but only due to completion of unrelated grade separations. In contrast, the Proposed Project would lower noise levels at 36 out of 49 study locations compared to existing conditions.

The No-Project Alternative would not meet the project's objective to improve regional air quality and reduce GHG emissions. The No-Project Alternative impedes the improvement of Bay Area air quality by continuing the use of diesel locomotives. Although the eventual replacement of existing diesels with Tier 4 diesel locomotives will reduce criteria air pollutant emissions in the future under the No-Project Alternative, they will not avoid emissions to the extent provided by the PCEP (FEIR, page 5-6). Continued efforts to expand transit ridership are baseline assumptions of the State Implementation Plan (SIP) relative to improving air quality to meet federal and state standards (Bay Area Air Quality Management District, *Bay Area Ozone Attainment Plan*, October 24, 2001). The No-Project Alternative

would fail to provide increased transit opportunities and will thereby impede the SIP's ability to meet air quality improvement goals.

Caltrain electrification is identified as a project to be funded as part of the *Plan Bay Area* (*Plan Bay Area*, page 90) adopted by the Metropolitan Transportation Commission (MTC). This plan includes the Bay Area's "Sustainable Communities Strategy" for actions needed to meet the greenhouse gas (GHG) emissions reduction target set by the California Air Resources Board under Senate Bill 375 of 2008. Because the new Tier 4 diesel locomotives are more powerful than the existing diesel locomotives, they would consume more fuel than the existing diesels they are replacing and thus GHG emissions would increase compared to existing conditions (FEIR, page 5-9). Also, the No-Project Alternative would not result in the substantial reductions in regional vehicle miles travelled (VMT) forecast to result from the Project (FEIR, page 11). The No Project Alternative would therefore obstruct attainment of GHG reductions and would be inconsistent with the Sustainable Communities Strategy.

The No-Project Alternative would be in conflict with the DTX and TTC projects because it would only provide for continued diesel train operations rather than the electrified operations anticipated by those projects. Diesel trains could not traverse the San Francisco tunnels that are a part of those projects. This would make infeasible full service connections between Caltrain, the San Francisco transit system, and the BART system that will be provided by the TTC. This conflicts with MTC's adopted *Plan Bay Area* (*Plan Bay Area* - Table 19: MTC Resolution 3434 Project Status, Page 79; Key Transit and Road Improvements, page 90).

The No-Project Alternative would require the JPB to forgo $705 million in state financing authorized by SB 1029 (Ch. 152, Stats. of 2012). The 2012 Budget Act provides these funds as part of the "blended service" portion of the high speed rail system for electrification of the Caltrain line for its future co-use by high speed rail. This would conflict with JPB policy, as reflected in the JPB's Capital Improvements Program that anticipates electrification of the line and in the Memorandum of Understanding entered into with the California High Speed Rail Authority and jurisdictions on the San Francisco Peninsula (FEIR, Section 1.2, *Project History*).

The No-Project Alternative would also not provide electrical infrastructure compatible with high speed rail operations. This conflicts with an objective of the project.

For all of the foregoing reasons, and any of them individually, the No-Project Alternative is determined to be infeasible.

DMU Alternative

Findings: The JPB hereby finds that this alternative is determined to be infeasible for the following reasons.

Facts in Support of Findings:

The DMU Alternative would increase ridership and service but not as well as the Proposed Project due to inferior acceleration performance as well as an inability to reach TTC via the DTX and thus would only partially meet the project objective to increase ridership and service (FEIR, page 5-15).

The DMU Alternative would meet the objective of increasing revenue (but not as well as the PCEP due to lower ridership) but not the objective of reducing operating fuel costs. Although the increased train

service under this alternative would increase revenue, this alternative would also increase diesel fuel consumption compared with No Project conditions[8] as shown in the FEIR Table 5-2, which would increase operating fuel costs.

The DMU Alternative would increase noise levels at up to 44 out 49 study locations compared to the No Project Conditions (FEIR, pg. 5-10) and at 40 locations compared to existing conditions (FEIR, Volume III, Appendix C) compared to the Proposed Project which would lower noise levels at 36 out of 49 study locations compared to existing conditions. Therefore, this alternative would conflict with the project objective of reducing noise emanating from trains.

The DMU Alternative would improve air quality conditions relative to existing conditions (FEIR, Table 5-6). The DMU Alternative would have lower criteria pollutant emissions of ROG, CO, and PM10 than No Project conditions, but higher NOx emissions (FEIR, Table 5-6). Compared to the Proposed Project, the DMU Alternative would have substantially higher NOx emissions as well (FEIR, Table 5-6). The DMU Alternative would have lower GHG emissions than existing conditions and No Project conditions, but substantially higher GHG emissions than the Proposed Project (FEIR, Table 5-8). Thus, the DMU Alternative would not meet the objective of improving regional air quality *and* GHG emissions as well as the Proposed Project.

The DMU Alternative would increase noise levels at up to 44 out 49 study locations compared to the No Project Conditions (FEIR, pg. 5-10) and at 40 locations compared to existing conditions (FEIR, Volume III, Appendix C) compared to the Proposed Project which would lower noise levels at 36 out of 49 study locations compared to existing conditions. Therefore, this alternative would conflict with the project objective of reducing noise emanating from trains.

The DMU Alternative would be in conflict with the DTX and TTC projects because it would not provide for the electrified train operations anticipated by those projects. Diesel trains could not traverse the San Francisco tunnels that are a part of those projects. This would make infeasible full service connections between Caltrain, the San Francisco transit system, and the BART system that will be provided by the TTC. This conflicts with MTC's adopted *Plan Bay Area* (*Plan Bay Area* - Table 19: MTC Resolution 3434 Project Status, Page 79; Key Transit and Road Improvements, page 90).

The DMU Alternative would require the JPB to forgo $705 million in state financing authorized by SB 1029 (Ch. 152, Stats. of 2012). The 2012 Budget Act provides these funds as part of the "blended service" portion of the high speed rail system for electrification of the Caltrain line for its future co-use by high speed rail. This would conflict with JPB policy, as reflected in the JPB's Capital Improvements Program that anticipates electrification of the line.

The DMU Alternative would also not meet the project's objective to provide electrical infrastructure compatible with high-speed rail. No such infrastructure would be built under this alternative.

For all of the foregoing reasons, and any of them individually, the DMU Alternative is determined to be infeasible.

[8] In general, DMUs are more fuel efficient than diesel locomotives for consists of five cars or fewer but less fuel efficient for consists longer than five cars. The PCEP includes six-car consists to accommodate approximately 600 passenger seats per train to meet ridership demands. Thus, an eight-car DMU was assumed to accommodate a similar level of passengers. Among many other considerations described in Chapter 5, *Alternatives*, train length and fuel efficiency are two reasons that a DMU option is not as favorable for the Caltrain service as EMUs would be.

Dual-Mode Multiple Unit Alternative

Findings: The JPB hereby finds that this alternative is ultimately rejected as infeasible for the following reasons.

Facts in Support of Findings:

While the Dual-Mode Multiple Unit Alternative would increase ridership and revenue, it would not reduce operating fuel cost (FEIR, Table 5-4). Although the increased train service under this alternative would increase revenue, this alternative would also increase diesel fuel consumption compared with existing conditions which would increase operating costs.

Presuming the Dual Mode MU Alternative would have similar train noise as the DMU Alternative, it would increase noise levels at up to 44 out 49 study locations compared to the No Project Conditions and at 40 locations compared to existing conditions compared to the Proposed Project which would lower noise levels at 36 out of 49 study locations compared to existing conditions. Therefore, this alternative would conflict with the project objective of reducing noise emanating from trains.

Presuming the Dual-Mode MU Alternative in diesel mode would have similar emissions to the DMU Alternative, it would improve air quality conditions relative to existing conditions, have lower criteria pollutant emissions of ROG, CO, and PM10 but higher NOx emissions than No Project conditions. Compared to the Proposed Project, the Dual Mode MU Alternative would have substantially higher NOx emissions as well. The Dual-Mode Alternative would have lower GHG emissions than existing conditions and No Project conditions, but substantially higher GHG emissions than the Proposed Project. Thus, the Dual Mode MU Alternative would not meet the objective of improving regional air quality *and* GHG emissions as well as the Proposed Project.

The Dual-Mode Multiple Unit Alternative would electrify only portions of the Caltrain line. This would conflict with MTC's adopted *Plan Bay Area* (*Plan Bay Area* - Table 19: MTC Resolution 3434 Project Status, Page 79; Key Transit and Road Improvements, page 90) which anticipates electrification of the entire line and connection to the TTC and DTX.

The Dual-Mode Multiple Unit Alternative would require the JPB to forgo $705 million in state financing authorized by SB 1029 (Ch. 152, Stats. of 2012). The 2012 Budget Act provides these funds as part of the "blended service" portion of the high speed rail system for electrification of the Caltrain line for its future co-use by high speed rail. This would conflict with JPB policy, as reflected in the JPB's Capital Improvements Program that anticipates electrification of the line.

The Dual-Mode Multiple Unit Alternative would not meet the project's objective to provide electrical infrastructure compatible with high-speed rail. OCP would be installed only in areas adjoining stations and for access to the TTC and DTX. Most of the line would remain without electrification.

For all of the foregoing reasons, and any of them individually, the Dual-Mode Multiple Unit Alternative is determined to be infeasible.

Tier 4 Diesel Locomotive (T4DL) Alternative

Findings: The JPB hereby finds that this alternative is ultimately rejected for the following reasons.

Facts in Support of Findings:

The T4DL Alternative would support increased ridership which would increase operating revenue but would not reduce operating fuel cost. This Alternative would likely have lower ridership due to inferior acceleration performance which could affect the number of stops and/or overall transit times. In the long run, ridership would be lower than the PCEP because this alternative could not reach the TTC through the DTX. Although the increase in train service under this alternative would increase revenue, this alternative would also increase diesel fuel consumption compared with existing conditions which would increase operating costs (FEIR, Table 5-4 and page 5-40). This alternative would not meet the project objective to reduce operating fuel costs.

This alternative would have greater engine noise compared to existing conditions and the No Project Alternative (FEIR, page 5-45). Compared to existing conditions, this alternative would increase noise levels at 38 out of 49 study locations, while lowering noise levels at 9 locations (FEIR, Table 5-10). In contrast, the Proposed Project would lower noise levels at 36 locations, while increasing noise levels at only 4 locations compared to existing conditions. Therefore, this alternative would conflict with the objective of reducing noise emanating from trains.

While the T4DL Alternative would improve air quality conditions relative to existing conditions (FEIR, Table 5-6). In 2020 and 2040, the T4DL single-head alternative would have lower criteria pollutant emissions than the No Project conditions. In 2020, the T4DL double-head alternative would have lower ROG, CO, and PM10 but higher NOx emissions than No Project conditions while in 2040 it would have lower criteria pollutant emissions than the Proposed Project (FEIR, Table 5-6). Compared to the Proposed Project, in 2020 and 2040 the T4DL Alternative would have substantially higher NOx emissions (FEIR, Table 5-6). In 2020 and 2040, the T4DL Alternative, single head variant would have lower GHG emissions than existing conditions and No Project conditions, but substantially higher GHG emissions than the Proposed Project (FEIR, Table 5-8). In 2020, the T4DL Alternative, double head variant would have higher GHG emissions than existing conditions but lower than No Project conditions, but substantially higher GHG emissions than the Proposed Project (FEIR, Table 5-8). Thus, the DMU Alternative would not meet the objective of improving regional air quality *and* GHG emissions as well as the Proposed Project.

The T4DL Alternative would be in conflict with the DTX and TTC projects because it would not provide for the electrified train operations anticipated by those projects. Diesel trains could not traverse the San Francisco tunnels that are a part of those projects. This would make infeasible full service connections between Caltrain, the San Francisco transit system, and the BART system that will be provided by the TTC. This conflicts with MTC's adopted *Plan Bay Area* (*Plan Bay Area* - Table 19: MTC Resolution 3434 Project Status, Page 79; Key Transit and Road Improvements, page 90), which anticipates full electrification of the line and connections to the TTC and DTX.

The T4DL Alternative would require the JPB to forgo $705 million in state financing authorized by SB 1029 (Ch. 152, Stats. of 2012). The 2012 Budget Act provides these funds as part of the "blended" portion of the high speed rail system for electrification of the Caltrain line for its future co-use by high speed rail. This would conflict with JPB policy, as reflected in the JPB's Capital Improvements Program that anticipates electrification of the line.

The T4DL Alternative would not meet the project's objective of providing electrical infrastructure compatible with high-speed rail.

For all of the foregoing reasons, and any of them individually, the T4DL Alternative is determined to be infeasible.

Electrification with OCS Installation by Factory Train Alternative

Findings: The JPB hereby finds that this alternative is not adopted for the following reasons.

Facts in Support of Findings:

The Factory Train is a new construction method being used for OCS installation for the first time in the United Kingdom in 2014. While it has the potential to lower construction time and cost, it could increase the intensity of construction disruption at night while shortening the duration of OCS construction. This alternative would not avoid any significant impacts of the Proposed Project, including any of the significant unavoidable impacts of the Proposed Project. As such, there is no requirement to adopt the Factory Train alternative in order to reduce significant unavoidable impacts of the Proposed Project.

Overriding Considerations

Introduction

CEQA requires decision-makers to balance the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve a project. If the specific economic, legal, social, technological or other benefits of the project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered acceptable (State CEQA Guidelines 15093). In this case, the lead agency must state in writing the specific reasons to support its action. This "statement of overriding considerations" shall be supported by substantial evidence in the record, shall be included in the record of the project approval, and should be mentioned in the notice of determination. Pursuant to Section 15093 of the CEQA Guidelines, a Statement of Overriding Considerations has been prepared for the project.

Significant Unavoidable Impact Summary

The FEIR identifies a number of significant, unavoidable impacts that would result from implementation of the PCEP as summarized below

- *Construction*
    - Cultural Resources – As described in the FEIR, Section 3.2, *Cultural Resources*, due to tunnel modifications necessary to provide heights for Caltrain and existing freight rail cars, the modifications to historic San Francisco Tunnel 4 may be significant and unavoidable even with mitigation.
    - Noise—As described in the FEIR, Section 3.11, *Noise and Vibration*, although project mitigation would reduce noise in many locations, given nighttime construction it may not always be possible to reduce construction noise to a less-than-significant level.
- *Operations*
    - Aesthetics—As described in the FEIR, Section 3.1, *Aesthetics*, although project mitigation would reduce tree removal/trimming effects in many locations, it may not always be possible to replace trees in locations that would avoid significant changes in localized visual character at individual parcels affected by tree removal/pruning. As described in Section 4.1, *Cumulative Impacts*, the Proposed Project would also contribute considerably to cumulative effects on local visual character, relative to tree removals/pruning.
    - Hydrology and Water Quality - As described in the FEIR, Section 3.9, *Hydrology and Water Quality*, the Caltrain ROW, including new Proposed Project facilities may be subject to future

flooding associated with sea level rise. Although project mitigation may be able to reduce the potential impacts of future flooding on the Proposed Project, given that effective coastal flooding mitigation requires the involvement of multiple parties beyond Caltrain, at this time it cannot be concluded that future flooding impacts to the Caltrain system will be fully avoided. As described in the FEIR, Section 4.1, *Cumulative Impacts*, this would also be considered a potential considerable contribution to a significant cumulative impact. As described in the FEIR, Section 3.9, *Hydrology and Water Quality*, given the *Ballona Wetlands* decision, it is unknown whether or not the impacts of sea level rise on a project are properly considered significant impacts under CEQA and thus this EIR discloses this impact for disclosure purposes in case they are.

- Noise—As described in the FEIR, Section 4.1, *Cumulative Impacts*, with cumulative passenger (HSR, ACE, CCJPA, DRC, Amtrak) and freight rail increases along the Caltrain corridor there would be significant noise increases affecting sensitive receptors. Where mitigation is not feasible to reduce the Proposed Project's noise contribution, the Proposed Project would also contribute to cumulative noise impacts at a number of locations.
- Transportation and Traffic: As described in the FEIR, Section 3.14, *Transportation and Traffic*, although project mitigation would reduce localized traffic impacts at a number of affected locations, it would not be feasible to reduce all localized traffic impacts with mitigation. As described in the FEIR, Section 4.1, *Cumulative Impacts*, the Proposed Project would also have a considerable contribution to a significant cumulative impact on localized traffic conditions, even with mitigation, and a potentially significant cumulative impact related to localized traffic and noise resulting from the diversion of limited amounts of freight from rail to truck modes (although diversion of freight to trucks is an unlikely impact).

Statements of Fact in Support of Overriding Considerations

The JPB hereby finds that the following social, legal, environmental and economic benefits of the Proposed Project outweigh the significant unavoidable impacts for the following reasons. These benefits, viewed both individually and collectively, outweigh the significant unavoidable adverse effects of implementing the PCEP:

- The PCEP would have far superior performance compared to existing diesel locomotives and compared to the other action alternatives (FEIR Table 5-1 and Figure 5-1). EMU's superior performance would maximize Caltrain's ability to increase service stops and/or travel times to support increased projected ridership demand. The increased peak hour and daily service allows Caltrain to serve more riders to meet growing ridership demand better than under existing conditions and better than achievable with any of the action alternatives. Increased ridership would also help to increase Caltrain's operating revenue.
- Increasing and modernizing Caltrain service will better serve growth in employment and housing projected in San Francisco, in the San Francisco Peninsula cities between San Francisco and San Jose, and in San Jose.
- The PCEP would lower operating fuel costs compared to both existing conditions and all the action alternatives analyzed in the FEIR (FEIR Table 5-4).
- The PCEP would reduce the generation of criteria air pollutants along the Caltrain Corridor and in the San Francisco Bay Area, including ozone precursors (ROG and NOx), carbon monoxide, and fine

particulates, which would improve public health for the community and help the Bay Area to achieve air quality goals for attainment. The PCEP would have substantially lower criteria pollutant emissions than any of the action alternatives analyzed in the FEIR (FEIR Table 5-6).

- The State has adopted AB-32, the Global Warming Solutions Act of 2006, which seeks to make a first step in reducing GHG. The long-term effects of climate change, if unchecked, could have substantial adverse effects on the economy, health, welfare and natural heritage of the San Francisco Peninsula and elsewhere. The JPB, in adopting the PCEP, desires to modernize the Caltrain system in a way that contributes most substantially to reducing greenhouse gas emissions to support California, national, and global efforts. The PCEP would have substantially lower GHG emissions than under existing conditions and compared to all of the action alternatives analyzed in the EIR (FEIR Table 5-8).
- The PCEP would reduce noise levels at most locations along the project route compared to existing conditions thus benefiting residences and other sensitive receptors affected by current train noise. The PCEP would have lower overall noise levels than the non-electrification alternatives analyzed in the EIR (FEIR Table 5-9 and 5-10).
- The State has adopted SB 375 and MTC adopted Plan Bay Area in 2013 in accordance with SB 375 which seek to lower vehicle miles travelled and associated greenhouse gas emissions among other goals. The PCEP supports SB 375 and Plan Bay Area both in terms of lowering VMT and associated emissions, but also in terms of supporting the plans of the communities along the Caltrain Corridor in promoting transit-oriented development.
- The benefit of lowered vehicle miles traveled along the entire San Francisco Peninsula and in every city along the project route overall (FEIR Table 3.14-15 and Table 4-16) outweighs the adverse effects of localized traffic increases at certain locations near grade crossings and Caltrain stations. Caltrain will continue to work with local, regional, state and federal partners to promote grade separations along the Caltrain Corridor as funding become available over time.
- The PCEP would be consistent with and supportive of the Downtown Extension (DTX)/Transbay Transit Center (TTC) project allowing better integration of transit services at the TTC between MUNI, BART, Caltrain, and other transit providers.
- The PCEP would be consistent with JPB policy, as reflected in the JPB's current and past strategic plans that anticipate and prioritize electrification of the line.
- While the PCEP does not include high-speed rail service, the PCEP would include electrical infrastructure compatible with future high-speed rail service proposed to connect Southern California and Northern California via a route that includes the Caltrain Corridor. The PCEP would be consistent with state financing authorized by SB 1029 (Ch. 152, Stats. of 2012). The 2012 Budget Act provides these funds as part of the "blended" portion of the high speed rail system for electrification of the Caltrain line for its future co-use by high speed rail.
- In June 2012, the Bay Area Council Economic Institute prepared a white paper called, *The Economic Impact of Caltrain Modernization*[9]. This white paper concluded that there would be considerable short-term and long-term economic benefits for the state and the region related to Caltrain electrification. There would be new construction jobs, California's gross state project would increase, state and local tax collections would increase, and property values near Caltrain could increase by $1

[9] Bay Area Council Economic Institute. 2012. The Economic Impact of Caltrain Modernization. Available: http://documents.bayareacouncil.org/caltrainecon.pdf.

billion. The City of Palo Alto also retained Economic & Planning Systems, Inc. (EPS) in June 2011[10] to evaluate the economic and property value impacts of Caltrain Electrification. This study also found that there would be a positive economic impact associated increased property values.

[10] Economic & Planning Systems. 2011. The Economic Impacts of Caltrain Electrification in Palo Alto. EPS #20119. June 7. Available (as part of City Council Agenda packet for June 23, 2011): http://www.cityofpaloalto.org/civicax/filebank/documents/27665.

MITIGATION MONITORING AND REPORTING PROGRAM

PENINSULA CORRIDOR ELECTRIFICATION PROJECT

(SCH# 2013012079)

San Francisco, San Mateo, and Santa Clara Counties, California

January 2015

ICF International. 2015. Mitigation Monitoring and Reporting Program for the Peninsula Corridor Electrification Project. January. (ICF 00606.12.) San Francisco, CA. Prepared for Peninsula Corridor Joint Powers Board, San Carlos, CA.

Mitigation Monitoring and Reporting Program

1.0 Introduction

The California Environmental Quality Act (CEQA) requires that a Lead Agency establish a program to monitor and report on mitigation measures that it has adopted as part of the environmental review process, and that this program must be adopted at the time that the agency determines to carry out a project for which the environmental review process has been conducted (Public Resources Code Section 21081.6 (a) (1)). The Peninsula Corridor Joint Powers Board (JPB) has prepared this Mitigation Monitoring and Reporting Program (MMRP) to ensure that mitigation measures identified in the Peninsula Corridor Electrification Project (Project) Environmental Impact Report (EIR) are fully implemented during project implementation.

As the lead agency and proponent of this project, the JPB will implement the mitigation measures through its own actions, those of the Design-Build (D-B) Contractor, the Design-Bid-Build (D-B-B) Tunnel Contractor and actions taken in cooperation with other agencies and entities. The JPB is ultimately accountable for the overall administration of the mitigation and monitoring program and for assisting relevant individuals and parties in their oversight and reporting responsibilities. The responsibilities of mitigation implementation, monitoring, and reporting extend to several entities including the D-B Contractor and the D-B-B Tunnel Contractor as described below. However, the JPB will bear the primary responsibility for verifying that the mitigation measures are implemented.

2.0 Design-Build Contractor and Design-Bid-Build Tunnel Contractor Responsibilities

The JPB has defined the mitigation measures required for the Project, the Design-Build (D-B) Contractor's responsibilities and the Design-Bid-Build (D-B-B) Tunnel Contractor's responsibilities.

The D-B Contractor shall:

- Implement the mitigation measures for which it is responsible, as identified in Table 1, Summary of Mitigation Measures;
- Monitor its and its subcontractors' construction activities to ensure that the mitigation measures are being properly implemented;
- Accurately report its activities and results to the JPB;
- As one of the D-B Contractor's Key Personnel, provide a qualified Environmental Compliance Lead for the Project who is acceptable to the JPB; and
- Provide additional specific expertise to fulfill specific roles as indicated in Section 4.0 to assist in the implementation of the MMRP.

The D-B-B Tunnel Contractor shall:

- Implement the mitigation measures for which it is responsible, as identified in Table 1, Summary of Mitigation Measures;
- Monitor its and its subcontractors' construction activities to ensure that the mitigation measures are being properly implemented; and
- Accurately report its activities and results to the JPB.

3.0 JPB Responsibilities

The JPB will provide oversight of the D-B Contractor's activity and the D-B-B Tunnel Contractor's activity, reports, and effectiveness of mitigation activities consistent with the reporting and monitoring schedule described in the column Implementation and Reporting Schedule in Table 1. The JPB will also implement mitigation that Table 1 indicates will be implemented by the JPB.

4.0 Table 1 – Summary of Mitigation Measures

The MMRP for the Project is presented as a table that includes the mitigation measures identified in the Final EIR. The table is organized by environmental issue. The JPB may refine the means by which it will implement a mitigation measure as long as compliance is achieved during project implementation. Several supplementary tables from the Final EIR are included at the end of this document that are referenced in the mitigation measures for ease of reference including FEIR Table 3.3-3 (Special Status Plant Species), 3.4-17 (2020 Traffic Mitigation), and 4-17 (2040 Project Mitigation).

4.1 Description of Table Headers

The MMRP describes implementation and monitoring responsibilities, timing, implementation and reporting schedules, and implementation mechanisms or tools for each mitigation measure identified in the EIR, as described below. Please note that the EIR mitigation in some cases specific "Contractor" which has been changed in this MMRP to specify "D-B" Contractor or "D-B-B Tunnel" Contractor for the purposes of clarity. Reference to D-B Contractor or D-B-B Tunnel Contractor includes any and all subcontractors, as appropriate, working the direction and authority of the D-B Contractor or the D-B-B Tunnel Contractor, respectively.

Mitigation Measure: Provides the mitigation measure as identified the Final EIR.

Implementing, Monitoring, and Reporting Responsibilities: Identifies the entities that will be responsible for directly implementing the mitigation measures, reporting and monitoring. Implementation can be the responsibility of the JPB, the D-B Contractor, the D-B-B Tunnel Contractor or other specified individuals such as a Qualified Biologist. Reporting on implementation will generally be the responsibility of the D-B Contractor (and the D-B-B Tunnel Contractor for tunnel work), with monitoring oversight provided by the JPB during the design and construction process. Post construction mitigation (such as monitoring replanted trees) may transition from the

D-B Contractor to JPB or may remain with D-B Contractor. Long-term mitigation responsibilities separate from construction will be held by the JPB.

Mitigation Timing: Implementation of mitigation will not all occur at the same time. Depending on the mitigation requirements, it may be undertaken prior to construction, during construction, following construction, or during operation of the project. These columns identify the stage(s) of the project during which the mitigation will be implemented and when reporting is to occur, if it is required.

Implementation and Reporting Schedule: This column of the table describes when the mitigation will be implemented and when reporting is to occur, if it is required.

Implementation Mechanism or Tool: Identifies the actions required to implement the mitigation measure, including any required agency consultation, documentation, agreements and/or conditions.

4.2 Implementation Roles

Responsibilities for implementation of this MMRP are as follows:

- **D-B Contractor**: Designated contractor responsible for design and construction and for implementing or monitoring and reporting mitigation measures as specified in this MMRP.
- **D-B-B Tunnel Contractor**: Designated contractor responsible for design and construction related to the San Francisco tunnels and for implementing or monitoring and reporting mitigation measures as specified in this MMRP.
- **JPB**: Lead Agency and designated representative responsible for the implementation, monitoring and reporting regarding mitigation measures specified in this MMRP.
- **Qualified Biologist**: A Qualified Biologist will be retained by the JPB for permitting and responsible for regulatory permit preparation and support. A Qualified Biologist will also be retained by the D-B contractor for construction, and will be responsible for preparing and providing a Worker Environmental Awareness Training Program, as well as providing oversight to the D-B Contractor's implementation of the biological mitigation and monitoring. Minimum qualifications for this position include the following: An individual with a bachelor's degree in biology or a similar natural resource field of study and prior experience monitoring the implementation of mitigation activities, as well as long-term success monitoring of mitigation projects.
- **USFWS-Approved Biologist**: A USFWS-Approved Biologist will be retained by the JPB for permitting and responsible for regulatory permit preparation and support. A USFWS-Approved Biologist will be retained by the D-B Contractor and will be responsible for ensuring the appropriate treatment of the California red-legged frog and San Francisco garter snake species and habitat, as identified in the EIR. Minimum qualifications for this position include the following: An individual with a bachelor's degree in biology or a similar natural resource field of study, possessing USFWS approval or a Section 10(A)(1)(a) permit to identify, handle, and relocate California red-legged frog and San Francisco garter snake.

- **Qualified Botanist**: A Qualified Botanist will be retained by the JPB, and will be responsible for surveying areas of proposed construction disturbance containing undeveloped habitat suitable to support the special-status plants identified in the EIR to support permitting. A Qualified Botanist will also be retained by the D-B Contractor and be responsible for preparing a revegetation and monitoring plan, in the event that avoidance of special-status plants during construction is not possible. Minimum qualifications for this position include the following: An individual with a bachelor's degree in botany, biology, or similar a natural resource field of study, possessing experience conducting botanical surveys for special-status plant species and vegetation restoration in the greater San Francisco Bay Area.

- **Certified Arborist**: A Certified Arborist will be retained by the JPB for tree survey and development of the Tree Avoidance, Minimization, and Replacement Plan in cooperation with the D-B contractor and will also be responsible for consulting with cities, counties, and affected property owners along the project corridor during plan preparation. A Certified Arborist will also be retained by the D-B Contractor for Project construction and will be responsible for overseeing the D-B Contractor's tree mitigation in conformance with the EIR. The D-B Contractor in general shall avoid impacts to trees along the alignment through its final design and layout of the OCS pole configuration, where feasible. Minimum qualifications for this position include the following: (1) Minimum 3 years full-time experience in arboriculture or 2-year degree in arboriculture and 2 years practical experience for a 4-year degree in related field and one year of practical experience; and (2) a currently Certified Arborist per the ISA (International Society of Arboriculture).

- **Qualified Architectural Historian**: A Qualified Architectural Historian will be retained by the JPB to support design implementation of historic resource mitigation as implemented by the D-B Contractor and the D-B-B Tunnel Contractor, and for certifying that the D-B and D-B-B Contractors' final designs are compliant with the historic resource mitigation. The JPB in turn will provide the certification to SHPO and procure SHPO's approval. Historic facilities include but are not limited to certain stations and tunnels in the right-of-way. The D-B Contractor and the D-B-B Tunnel Contractor will each retain a Qualified Architectural Historian to verify that construction they supervise is in compliance with the historic resource mitigation. Minimum qualification for this position are a graduate degree in architectural history, art history, historic preservation, or closely related field, with coursework in American architectural history, or a bachelor's degree in architectural history, art history, historic preservation or closely related field plus one of the following: At least two years of full-time experience in research, writing, or teaching in American architectural history or restoration architecture with an academic institution, historical organization or agency, museum, or other professional institution; or Substantial contribution through research and publication to the body of scholarly knowledge in the field of American architectural history

- **Qualified Professional Archaeologist**: A Qualified Professional Archaeologist will be retained by the D-B Contractor and will meet the Secretary of the Interior (SOI) Standards of Archaeology. The Qualified Professional Archaeologist will be responsible for implementing mitigation and coordinating the status of the archaeological mitigation with the JPB and the D-B Contractor. The Qualified Professional Archaeologist will also be responsible for coordinating with the local Native American community. Minimum qualification for this

position are a graduate degree in archeology, anthropology, or closely related field plus: At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management; At least four months of supervised field and analytic experience in general North American archeology, and Demonstrated ability to carry research to completion.

- **Archaeological Monitor**: Archaeological monitors will be retained by the D-B Contractor and will be responsible for field monitoring of archaeological resources. The JPB will perform pre-construction investigation. Minimum qualification for this position are a Bachelor's degree in anthropology with an emphasis in archaeology or closely related field (such as history or geology) and subsequent course work in archaeology and twelve months professional archaeology experience in California.

- **Qualified Geologist**: A Qualified Geologist will be retained by the D-B Contractor, and will be responsible for preparing design-level geotechnical investigations for all Traction Power Facilities (TPFs). Minimum qualifications for this position are that the consultant be a Professional Geologist (P. G.), registered in California, with experience conducting geotechnical investigations.

- **Qualified Geotechnical Engineer**: A Qualified Geotechnical Engineer will be retained by the D-B Contractor, and will be responsible for conducting field observations and testing of onsite soils and formations to identify and define the limits of expansive materials. Minimum qualifications for this position are that the consultant be a Professional Geotechnical Engineer (P. G. E.), registered in California, with experience conducting assessment of soil conditions.

- **Qualified Environmental Consultant for additional hazardous material site assessment**: A Qualified Environmental Consultant will be retained by the JPB and will be responsible for preparation of a Phase II Environmental Site Assessment (ESA). The D-B Contractor shall retain a Qualified Environmental Consultant who can assess whether hazardous materials are encountered and oversee their removal, disposal and remediation in accordance with all applicable rules, regulations and laws. Minimum qualifications for this position are that the consultant be a Professional Engineer (P.E.) or Professional Geologist (P. G.), registered in California, with experience conducting Phase II ESAs.

- **Qualified Acoustical Consultant**: A Qualified Acoustical Consultant will be retained by the D-B Contractor, and will be responsible for conducting site-specific acoustical analysis of ancillary facilities. The D-B Contractor shall design, select equipment and install equipment such that acoustical levels during operations at all traction power facility sites comply with the EIR requirements. Minimum qualifications for this position include the following: 10+ years of experience as practicing acoustical consultant; and a licensed professional engineer or Board Certified by the Institute of Noise Control Engineering.

5.0 Design-Build Contractor Environmental Compliance Lead

The D-B Contractor's Environmental Compliance Lead shall have a minimum of 10 years of experience overseeing and implementing compliance with requirements of environmental impact reports and required mitigations on major construction projects in California. The individual shall have expertise in compliance, mitigation, and in CEQA and NEPA regulations.

6.0 Project Team Organization

Implementation of the MMRP will be a team effort consisting of both JPB and D-B Contractor personnel. The D-B Contractor's Environmental Compliance Lead shall be responsible for communications and coordination with the JPB's designated environmental lead regarding all MMRP activities throughout the duration of design and construction of the Project and following construction as determined by the JPB.

D-B Contractor team members with specialized expertise identified in Section 4.2 shall report to the D-B Contractor's Environmental Compliance Lead and shall work closely with JPB-designated experts in similar disciplines.

It is anticipated that, at a minimum, monthly meetings will be held between JPB and D-B Contractor environmental leads and staffs to review status and progress relative to MMRP activities. Additionally, the JPB and D-B Contractor environmental leads shall ensure that all pre-requisite MMRP activities to design and construction are completed in a timely manner.

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Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
AES-2a: Minimize OCS construction activity on residential and park areas outside the Caltrain ROW. OCS construction activities outside the Caltrain ROW in residential and park areas along the Caltrain ROW shall be minimized in extent and duration to the maximum extent feasible. JPB shall include the following requirements for construction contractors: • Staging areas shall not be located in parks or on residential land. • Access routes shall not be located in parks and shall avoid use of residential land wherever feasible • OCS construction on residential lands shall only be during daylight hours, wherever feasible. • OCS construction on park lands shall be during hours when parks are closed, wherever feasible. • The duration of OCS construction on residential and park lands shall be minimized. Material and equipment shall be brought to such sites as close to the start time of construction as possible and shall be removed from such sites as soon after construction completion as possible. • If multiple day construction is required on a residential or park parcel, construction materials and equipment shall be kept in good order and all trash and debris contained. • Construction contractors shall coordinate with park facility operators and residential landowners and residents to inform them of planned construction activities well in advance of construction.	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor **Reporting Party:** D-B Contractor and D-B-B Tunnel Contractor **Monitoring Party:** JPB	**X**	**X**			**Implementation:** JPB will develop specific requirements to be included in contracts which will then be implemented by the D-B Contractor and the D-B-B Tunnel Contractor. **Reporting:** D-B Contractor and D-B-B tunnel Contractor shall present OCS proposed construction schedule to JPB for review and approval highlighting activity on/adjacent to residential areas and parks. Monthly during construction from D-B Contractor and D-B-B tunnel Contractor to JPB.	OCS Construction Schedule Review. The D-B Contractor and the D-B-B Tunnel Contractor will be contractually bound to comply with these requirements.
AES-2b: Aesthetic treatments for OCS poles, TPFs in sensitive visual locations, and Overbridge Protection Barriers. New infrastructure (OCS poles, TPF-associated structures and equipment, fencing at TPFs, and overbridge protection barriers) associated with the Proposed Project will be designed in a manner that allows these features to blend with the surrounding built and natural environments as much as possible. Measures will include, but are not limited to, the following: • Aesthetic treatments to project features will be implemented to help soften their visual intrusion upon the landscape, especially in areas of high use. OCS Pole Design • The JPB shall coordinate with local jurisdictions to obtain their input into OCS pole design relative to station aesthetics. • Aesthetic considerations shall be considered when selecting pole design. Different pole designs, including round poles, square poles, and multi-face poles, have different characteristics. Some individuals find square poles to be aesthetically less desirable due to their angularity. • In addition, the JPB shall consider options to reduce pole diameter by using thinner diameter poles that are constructed with thicker walls. • Aesthetic considerations shall be balanced with other considerations including cost,	**Implementing Party:** D-B Contractor **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	**X**				**Implementation:** Requirements will be specified in design-build contracts and incorporated into the final design by the D-B Contractor. **Reporting:** D-B Contractor shall provide JPB with recommended design solutions for review and approval prior to final design.	Design Review. The D-B Contractor will be contractually bound to implement these requirements during final design, and they will be verified following construction.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
safety, maintenance, and durability. • The JPB shall also evaluate the potential to house OCS wire-tensioning weights inside larger diameter poles. • The JPB will also place OCS wires on the track-side of the poles, where feasible. • Features will be constructed with low sheen and non-reflective surface materials to reduce potential for glare. Unpainted metal surfaces will not be permitted. Traction Power Facilities • The JPB shall coordinate with local jurisdictions regarding color selection and vegetative screening for aesthetic treatments at sensitive TPF sites for current uses (PS3, Option 1; PS5, Option 1, Option 1B and 2; PS6, Option 1 and 2; and PS7) or in the event of future adjacent residential or park/plaza uses (PS4, Options 1 and 2 and SWS Option 1) or in the event of future adjacent residential or park/plaza uses (PS4, Options 1 and 2 and SWS Option 1). • Vegetative screening will be provided to visually buffer views of TPFs. Vegetative screening may be achieved in a variety of ways, depending on availability of space. Where feasible and necessary, the paralleling station standard design of 40' X 80' shall be modified to allow for more space for vegetative screening (such as 30' X 105' for example). Acceptable methods of vegetative screening that may be used include: • Tree planting • Fencing with creeping vines. • Landscape buffer planting. • Vegetative wall/fence. The options above could be adjacent to the TPF perimeter and/or could be placed in other locations nearby where they would help to reduce the visual apparentness of the TPF and/or enhance the visual aesthetics near to the TPF location. For example, at PS5, Option 1B, tree planting on the east side of Alma Street in the sidewalk median, if allowed by the City of Palo Alto, could help to obscure the view of the facility from residences that back onto Alma Street. The JPB shall maintain all vegetative screening on an on-going basis on JPB properties. If screening vegetation is placed outside the JPB ROW, the JPB will coordinate with the local jurisdiction on maintenance responsibilities • Features will be colored or painted a shade that is two to three shades darker than the general surrounding area. Light or bright colors will be avoided. Colors will be chosen from the U.S. Department of the Interior Bureau of Land Management Standard Environmental Colors Chart CC-001: June 2008. Because color selection will vary by location, the facility designer shall employ the use of color panels evaluated from key observation points during common lighting conditions (front light versus backlighting) to aid in the appropriate color selection. Color selection will be made for the coloring of the most prevalent season. • All paints used for the color panels and structures will be color matched directly from the physical color chart, rather than from any digital or color-reproduced versions of the color chart. Paints will be of a dull, flat, or satin finish to reduce potential for glare, and the use of glossy paints for surfaces will be avoided. Appropriate paint type will be							

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
selected for the finished structures to ensure long-term durability of the painted surfaces. The appropriate operating agency or organization will maintain the paint color over time. • TPFs will be managed and maintained for a well-kept appearance and in a manner that vandalism and graffiti is abated semi-annually to maintain the effectiveness and attractiveness of the visual mitigation prescribed herein. Overbridge Protection Barriers • JPB will coordinate with the appropriate city staff on design selection of overbridge protection barriers and fencing that would be viewed from highly used public spaces and historical train stations. • Overbridge protection barriers shall be designed to recede into the visual landscape as much as possible and to match the aesthetic character on the existing overpass. • While Caltrain will retain final approval, Caltrain will make effort to accommodate local input and preference when selecting overbridge protection materials.							
AES-4a: Minimize spillover light during nighttime construction. During nighttime construction adjacent to residential neighborhoods, the JPB will require the contractor to direct any artificial lighting onto the worksite and away from any adjacent residential areas at all times. The construction contractor will notify nearby residences of the construction schedule, prior to the start of construction, including the time periods for nighttime construction. A point of contact, including contact information, will be provided to residents to address concerns associated with construction and nighttime lighting.	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor **Reporting Party:** D-B Contractor and D-B-B Tunnel Contractor **Monitoring Party:** JPB		**X**			**Implementation:** Requirements will be specified in contracts, and will be implemented by the D-B Contractor and D-B-B Tunnel Contractor for the duration of construction. **Reporting:** Monthly	The D-B Contractor and the D-B-B Tunnel Contractor will be contractually bound to comply with these requirements.
AES-4b: Minimize light spillover at TPFs. The JPB will ensure that all artificial outdoor lighting associated with traction power facilities will be limited to safety and security requirements and will be designed to minimize light spill over into adjacent areas. All lighting is to provide minimum impact on the surrounding environment and will use downcast, cut-off type fixtures that are shielded and that direct the light only towards objects requiring illumination. Lights will be installed at the lowest allowable height and cast low-angle illumination while minimizing incidental light spill onto adjacent properties and open spaces. The lowest allowable wattage will be used for all lighted areas and the amount of nighttime lights needed to light an area will be minimized to the highest degree possible. Light fixtures will have non-glare finishes that will not cause reflective daytime glare. Lighting will be designed for energy efficiency, use, and have daylight sensors or be timed with an on/off program. Lights will provide good color rendering with natural light qualities with the minimum intensity feasible for security, safety, and personnel access. Lighting, including light color rendering and fixture types, will be designed to aesthetically minimize the profile of the TPFs.	**Implementing Party:** D-B Contractor **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	**X**				**Implementation:** Requirements will be specified in design-build contracts. **Reporting:** Prior to final design and following construction.	The D-B Contractor will be contractually bound to implement these requirements during final design, and they will be verified following construction.
AQ-2a: Implement BAAQMD basic and additional construction mitigation measures to reduce construction-related dust. JPB will require all construction contractors to implement the basic and additional construction mitigation measures recommended by BAAQMD to reduce fugitive dust emissions. Emission reduction measures will include, at a minimum, the following measures. Additional measures may be identified by BAAQMD or the contractor as appropriate. • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor **Reporting Party:** D-B Contractor and D-B-B Tunnel Contractor **Monitoring Party:** JPB	**X**	**X**			**Implementation:** Requirements will be specified in contracts, and will be implemented by the D-B Contractor and the D-B-B Tunnel Contractor for the duration of construction. **Reporting:** The D-B Contractor and the D-B-B Tunnel Contractor shall provide a dust mitigation plan to JPB for review and approval. The D-B Contractor and the D-B-B Tunnel	Dust Mitigation Plan. The D-B Contractor and the D-B-B Tunnel Contractor will be contractually bound to comply with these requirements.

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unpaved access roads) will be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off site will be covered. • All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads will be limited to 15 mph. • All roadways, driveways, and sidewalks to be paved will be completed as soon as possible. Building pads will be laid as soon as possible after grading unless seeding or soil binders are used. • A publicly visible sign will be posted with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. BAAQMD's phone number will also be visible to ensure compliance with applicable regulations. • All grading and demolition will be suspended when wind speeds exceed 20 mph. • Wind breaks will be installed on the windward side(s) of actively disturbed areas of construction. • Vegetative ground cover (e.g., fast-germinating native grass seed) will be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. • The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time will be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time. • Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.						Contractor shall require daily recording/ monthly reporting throughout construction.	
AQ-2b: Implement BAAQMD basic and additional construction mitigation measures to control construction-related ROG and NOX emissions. JPB will implement the following BAAQMD-recommended basic and additional control measures to reduce ROG and NOX emissions from construction equipment. • All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified mechanic and determined to be running in proper condition prior to operation. • Minimize the idling time of diesel powered construction equipment to two minutes. Clear signage will be provided for construction workers at all access points. • Require that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOX and PM. • Require all Contractors use equipment that meets the ARB's most recent certification standard for off-road heavy duty diesel engines.	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor **Reporting Party:** D-B Contractor and D-B-B Tunnel Contractor **Monitoring Party:** JPB	**X**	**X**			**Implementation:** Requirements will be specified in contracts, and will be implemented by the D-B Contractor and D-B-B Tunnel Contractor for the duration of construction. **Reporting:** The D-B Contractor and the D-B-B Tunnel Contractor shall prepare an equipment emissions control plan for JPB review and approval prior to construction. The D-B Contractor and the D-B-B Tunnel Contractor shall require daily recording/ monthly reporting throughout construction to confirm implementation during construction. The JPB shall review compliance as part of annual construction reviews.	Equipment Emissions Control Plan The D-B Contractor and the D-B-B Tunnel Contractor will be contractually bound to comply with these requirements.
AQ-2c: Utilize clean diesel-powered equipment during construction to control construction-related ROG and NOX emissions. JPB will ensure that all offroad diesel-powered equipment used during construction will be	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor **Reporting Party:** D-B Contractor and D-	**X**	**X**			**Implementation:** Requirements will be specified in contracts, and will be implemented by the D-B Contractor and D-B-B Tunnel	Equipment Emissions Control Plan The D-B Contractor and D-B-B Tunnel Contractor will be contractually bound to

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equipped with an EPA Tier 3 or cleaner engines, except for specialized construction equipment in which an EPA Tier 3 engine is not available. This mitigation measure assumes emission reductions compared with a fleet-wide average Tier 2 engine.	B-B Tunnel Contractor **Monitoring Party:** JPB					Contractor for the duration of construction. **Reporting:** The D-B Contractor and D-B-B Tunnel Contractor shall prepare an equipment emissions control plan for JPB review and approval prior to construction. The D-B Contractor and D-B-B Tunnel Contractor shall require daily recording/ monthly reporting throughout construction to confirm implementation during construction. The JPB shall review compliance as part of annual construction reviews	comply with these requirements.

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BIO-1a: Implement general biological impact avoidance measures. The following practices will be implemented when each applies as determined by the construction schedule and specific construction activities. • A Worker Environmental Awareness Training Program for construction personnel will be conducted by a qualified biologist retained by JPB. The program will provide workers with information on their responsibilities with regard to the special-status species, including central California steelhead, San Francisco garter snake, western pond turtle, California tiger salamander, California red-legged frog, Townsend's big-eared bat, pallid bat, hoary bat, fringed myotis, Cooper's hawk, great blue heron, western burrowing owl, northern harrier, white-tailed kite, American peregrine falcon, saltmarsh common yellow throat, and purple martin. The training will provide a physical description of the special-status species that have potential to occur and be affected by construction activities to each construction crew prior to the initiation of the crew's construction activities. The worker awareness training will also detail each species' habitat and legal protections, a photo of relevant species, and contact information for the primary biologist. • Precautions to prevent pollution of streams, waterways, and other bodies of water during construction. • Dust control through watering of appropriate surfaces. • Clearing and grubbing procedures that specify that only trees and plants designated for removal will be removed. • Excavation techniques to ensure the stability of subsurface materials as well as retention of excavated materials within the construction areas. • Materials and fluids generated by construction activities will be placed at least 30 meters (100 feet) from wetland areas or drainages and covered until they are disposed of at a permitted site. • All natural communities and wetland areas located outside the construction zone that could be affected by construction activities will be temporarily fenced off and designated Environmentally Sensitive Area(s) to prevent accidental intrusion by workers and equipment. • Sensitive habitat and wetland (including other waters of the United States and waters of the state) areas will be identified during Project design and avoided during construction to the maximum extent feasible.	**Implementing Party:** Qualified Biologist and D-B Contractor **Reporting Party:** Qualified Biologist/Botanist **Monitoring Party:** JPB	**X**	**X**			**Implementation:** Qualified Biologist will prepare and present the Worker Environmental Awareness Training Program to all construction personnel prior to the start of construction activities. Qualified Botanist will complete jurisdictional delineation of all potentially affected wetlands and will work with D-B Contractor on avoidance measures as part of design. Wetland avoidance technical memorandum presenting rationale why avoidance is not possible for any unavoidable impacts to wetland will be presented to JPB for review and approval. Wetland permits will be obtained from USACE and RWQCB as necessary for any temporary or permanent impacts to wetlands. D-B Contractor will comply with the measures for the duration of construction. **Reporting:** Daily recording/ monthly reporting throughout construction	Wetland Delineation prepared by a Qualified Botanist. Worker Environmental Awareness Training Program prepared by a Qualified Biologist. The D-B Contractor will be contractually bound to comply with these requirements.
BIO-1b: Implement special-status plant species avoidance and revegetation measures. During the design phase, prior to construction, JPB will retain a qualified botanist to survey any areas of proposed construction disturbance that contain undeveloped habitat suitable to support Franciscan onion, bent-flowered fiddleneck, round-leaved fillaree, bristly sedge, Congdon's tarplant, Santa Clara Valley dudleya, marsh microseris, white seaside tarplant, San Francisco campion, or showy rancheria clover. The qualified botanist will survey appropriate areas of suitable habitat for these species during each species' blooming period (Table 3.3-3[of the EIR]). If no special-status plants are identified during the design-period surveys, then no further action is necessary. If one or more special-status species is found within areas proposed for disturbance in the project corridor, then the occurrence will be avoided, if feasible. If avoidance is not possible, then a revegetation and monitoring plan would be developed and executed by a qualified botanist	**Implementing Party:** Qualified Botanist and D-B Contractor **Reporting Party:** Qualified Botanist **Monitoring Party:** JPB	**X**	**X**	**X**		**Implementation:** Qualified Botanist will conduct a plant survey during final design and prior to the start of construction. Qualified Botanist will prepare a Revegetation and Monitoring Plan in the event that avoidance of special-status plants is not possible; this plan will be implemented with yearly monitoring for success criteria as specified in the mitigation measure. **Reporting:** A report will be prepared following the completion of construction. In the event that	The D-B Contractor will be contractually bound to comply with avoidance of species habitat, where avoidance is possible. Preparation and implementation of a Revegetation and Monitoring Plan by the Qualified Botanist, in the event that avoidance of special-status plants is not possible.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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retained by JPB that would consist of collection of seed prior to disturbance, reseeding and revegetation after disturbance, and monitoring. Most of the project construction consists of installing OCS poles and wires which have a minimal footprint and, thus, revegetation will be possible in areas where special-status plants may be disturbed. The plan will include revegetation success criteria of 80% of the reseeded target area, in perpetuity conservation of restoration areas, weed management, limiting human access, monitoring for at least 5 years and until success is demonstrated for 3 consecutive years, and remediation measures if success is not achieved by year 5. Monitoring will continue until the success criteria are completely satisfied.						avoidance of special-status plants is not possible, monitoring reports will be prepared on a yearly basis until success criteria are completely satisfied,	
BIO-1c: Implement California red-legged frog and San Francisco garter snake avoidance measures. • Implement the Worker Environmental Awareness Training Program described under Mitigation Measure BIO-1a: Implement general biological impact avoidance measures. • All potential California red-legged frog and San Francisco garter snake habitat that can be avoided by construction activities will be flagged by a USFWS-approved biologist prior to grading or other construction activities. All California red-legged frog and San Francisco garter snake habitat will be protected by a 10-foot buffer with exclusionary fencing to make it easily avoided by construction crews. • The construction site will be monitored by a qualified and federally permitted biologist during all phases of construction to remove any California red-legged frogs and San Francisco garter snakes found in the construction area. Individual frogs and snakes will be moved immediately to a site that is a minimum of 330 feet from the construction boundary. The relocation site will be determined prior to commencement of construction activities. • Construction activities near drainages identified as potential migration corridors will take place between May 15 and October 31 when the California red-legged frog and San Francisco garter snake are least likely to be present in the project corridor. • To discourage California red-legged frogs from entering the project impact areas via the freshwater ditches west of the impact areas, the ditches will be equipped with lightweight, one-way flow gates. These will be designed so that water can easily pass from the project site to the ditches, but small vertebrates such as the frog cannot move upstream from the ditches to the project site.	**Implementing Party:** USFWS-Approved Biologist and D-B Contractor **Reporting Party:** USFWS-Approved Biologist **Monitoring Party:** JPB	**X**	**X**			**Implementation:** USFWS-Approved Biologist will identify and demarcate species habitat prior to the initiation of construction activities, and will monitor all construction activities in sensitive areas for the duration of construction. Construction activities near drainages identified as migration corridors will be restricted between May 15 and October 30. **Reporting:** Daily recording and monthly reporting for the duration of construction	Worker Environmental Awareness Training Program prepared by a Qualified Biologist. The D-B Contractor will be contractually bound to comply with these requirements.
BIO-1d: Implement western pond turtle avoidance measures. Prior to the start of construction activities at sites that may support western pond turtle (defined as any undeveloped areas within 400 feet of creeks), JPB will retain a qualified biologist to conduct preconstruction surveys for pond turtles in all suitable habitats in the vicinity of the project corridor. Surveys will take place at each area of suitable habitat that will be disturbed no more than 7 days prior to the onset of site preparation and construction activities with the potential to disturb turtles or their habitat. If preconstruction surveys identify active nests, the biologist will establish no-disturbance buffer zones around each nest using temporary orange construction fencing. The demarcation should be permeable to allow young turtles to move away from the nest following hatching. The radius of the buffer zone and the duration of exclusion will be determined in consultation with the CDFW. The buffer zones and fencing will remain in place until the young have left the nest, as determined by the qualified biologist. If western pond turtles are found in the project corridor, a qualified biologist will remove and relocate them to suitable habitat outside of the project limits, consistent with CDFW protocols and permits. Relocation sites will be subject to agency approval.	**Implementing Party:** Qualified Biologist and D-B Contractor **Reporting Party:** Qualified Biologist **Monitoring Party:** JPB	**X**	**X**			**Implementation:** No more than 7 days prior to start of construction. **Reporting:** Following preconstruction survey; weekly recording and monthly reporting thereafter for the duration of construction.	Qualified Biologist will work with D-B Contractor to establish no disturbance buffers as needed.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
BIO-1e: Implement Townsend's big-eared bat, pallid bat, hoary bat, and fringed myotis avoidance measures. Prior to the start of construction activities at sites offering suitable bat roosting habitat, JPB will retain a qualified biologist to conduct preconstruction surveys for Townsend's big-eared bat, pallid bat, hoary bat, and fringed myotis. Surveys will take place no more than 7 days prior to the onset of site preparation and construction activities with the potential to disturb bats or their habitat and will include close inspection of potential bat roosts, such as trees and any built features within the work footprint. If special-status bats are found in the project footprint and avoidance of roosting areas is not possible, a qualified wildlife biologist will consult with CDFW staff to identify the appropriate protection measures. The contractor will be responsible to ensure that CDFW requirements are implemented. Multiple survey visits and survey methods may be required at a single site to determine presence or absence of roosting bats, specifically Townsend's big-eared bat, depending on season and roost type.	**Implementing Party:** Qualified Biologist and D-B Contractor **Reporting Party:** Qualified Biologist **Monitoring Party:** JPB	X	X			**Implementation:** No more than 7 days prior to start of construction. **Reporting:** Following preconstruction survey; weekly recording and monthly reporting thereafter for the duration of construction.	Qualified Biologist will consult with CDFW and implement protection measures as needed.
BIO-1f: Implement western burrowing owl avoidance measures. Prior to any construction activity planned to begin during the fall and winter non-nesting season (September 1 through January 31) during the survey or at any time during the construction process, JPB will retain a qualified wildlife biologist to conduct a preconstruction survey for burrowing owls. Surveys will be conducted at each area of suitable habitat that will be disturbed no more than 7 days prior to ground disturbing activities and will cover all suitable burrowing owl habitat subject to disturbance pursuant to the March 7, 2012 California Department of Fish and Game Staff Report on Burrowing Owl Mitigation (California Department of Fish and Game 2012). If any western burrowing owls are found within the disturbance area, the contractor will notify CDFW and will proceed under CDFW direction. If construction is planned to occur during the nesting season (February 1 through August 31), surveys for nesting owls will be conducted by a qualified wildlife biologist in the year prior to construction to determine if there is breeding pair within 150 meters (approximately 492 feet) of the construction footprint, unless the biologist determines that a smaller survey buffer around the construction footprint is called for based on preexisting background disturbance and conditions. This will provide the project team advance notice regarding nesting owls in the project area and allow ample time to discuss with CDFW regarding the appropriate course of action if nesting owls are found. In addition, same-year preconstruction surveys for nesting western burrowing owls will be conducted no more than 7 days prior to ground disturbance in all suitable burrowing owl habitat relative to the proposed date of disturbance. If the biologist identifies the presence of a burrowing owl nest in an area scheduled to be disturbed by construction, a 200-meter no-activity buffer will be established and maintained around the nest while it is active. Surveys and buffer establishment will be performed by qualified wildlife biologists, will be coordinated with CDFW, and will be subject to CDFW review and oversight.	**Implementing Party:** Qualified Biologist and D-B Contractor **Reporting Party:** Qualified Biologist **Monitoring Party:** JPB	X	X			**Implementation:** No more than 7 days prior to start of construction or in the year prior to construction if construction starts during nesting season. **Reporting:** Following preconstruction survey; weekly recording and monthly reporting thereafter for the duration of construction.	Qualified Biologist will consult with CDFW and implement protection measures as needed.
BIO-1g: Implement northern harrier, white-tailed kite, American peregrine falcon, saltmarsh common yellowthroat, purple martin, and other nesting bird avoidance measures. • Implement the Worker Environmental Awareness Training Program described under Mitigation Measure BIO-1a: Implement general biological impact avoidance measures. • Preconstruction surveys for nesting migratory birds, including raptors if construction will occur between February 1 and August 31. If active nests are found during the survey, no-disturbance species-specific buffer zones will be established by a qualified biologist and marked with high-visibility fencing, flagging, or pin flags. Typical active	**Implementing Party:** USFWS-Approved Biologist and D-B Contractor **Reporting Party:** USFWS-approved Biologist **Monitoring Party:** JPB	X	X			**Implementation:** Prior to construction and in each year when construction is proposed between February 1 and August 31. **Reporting:** Following preconstruction survey; weekly recording and monthly reporting thereafter for the duration of construction.	USFWS-Approved Biologist will consult with USFWS and implement protection measures as needed.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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nest buffers for non-raptorial birds are 50 feet and 250 feet for raptors. • Prior to construction activities, a USFWS-approved biologist will conduct a preconstruction survey of all potential nesting habitat for tree and ground-nesting raptors as well as purple martins and other swallow species that use cavities in human-made structures (i.e., overpasses) as nest sites or that construct nests that adhere to the aforementioned human-made structures to record the presence and location of nesting swallows. • If construction during the breeding season cannot be avoided, then USFWS-approved exclusionary devices such as netting, panels, or metal projectors will be installed over the entrances to the identified cavities and/or nest sites prior to the swallows' arrival in mid-March. No exclusionary devices will be installed after the breeding season begins (i.e., March 15 through August 15), nor will the cavities or external nests be blocked if birds are occupying them. All installation of exclusionary devices will be supervised by the USFWS-approved biologist. • Alternatively, no preconstruction surveys for nesting swallows would be conducted; however, all drainage holes or other cavities, or suitable nest substrates associated with human-made structures within the project corridor that may be used by nesting swallows would be fitted with the exclusionary devices described above prior to the birds' arrival in mid-March. • All exclusionary devices will be monitored and maintained throughout the breeding season to ensure that they are successful in preventing the birds from accessing the cavities or nest sites. Upon the project's completion, the exclusionary devices will be removed from the site unless otherwise authorized by USFWS. • All proposed new facility sites are recommended for nesting bird surveys in advance of construction activities if trees are to be removed during the breeding season. Although the majority of the proposed facility sites are located within previously disturbed areas, potential exists for birds to nest within suitable habitat present on or adjacent to these sites.							
BIO-1h: Conduct biological resource survey of future contractor-determined staging areas. JPB will retain a qualified biologist to conduct a survey of future contractor-determined staging areas prior to any project-related activities commencing in such locations. The biologist will identify any wetlands, other waters of the United States or state, sensitive habitat, and suitable habitat for special-status species. The biologist will work with the contractor, who will avoid such sensitive biological resources to the extent possible through the adjustment of the proposed staging area(s). For habitat where special-status species or other protected species could occur (e.g., occasional upland migration habitat) that could be affected by staging activities, other applicable mitigation measures (BIO-1a to BIO-1g, BIO-1i, BIO-2, BIO-3, BIO-5, BIO-6, and HYD-1) will be implemented for impacts that would occur at the contractor-proposed staging locations.	**Implementing Party:** Qualified Biologist and D-B Contractor **Reporting Party:** Qualified Biologist **Monitoring Party:** JPB	**X**	**X**			**Implementation:** Qualified Biologist will conduct a survey prior to project-related activities. **Reporting:** Following establishment of construction staging areas.	The D-B Contractor will be contractually bound to comply with this requirement. Qualified Biologist will work with D-B contractor to adjust proposed staging area(s) as needed avoid sensitive biological resources to the extent possible.
BIO-1i: Minimize impacts on Monarch butterfly overwintering sites. Prior to and during construction, a qualified biologist will periodically monitor the project ROW to evaluate whether Monarch butterfly overwintering sites have been established within areas that would be disturbed by the Proposed Project construction. If no overwintering sites are identified, then no further action is necessary. If overwintering sites become established, then project construction will avoid disturbing the sites during the overwintering period. Outside of the overwintering period, Proposed Project construction may proceed without constraint at the	**Implementing Party:** Qualified Biologist and D-B Contractor **Reporting Party:** Qualified Biologist **Monitoring Party:** JPB	**X**	**X**			**Implementation:** Qualified Biologist will periodically monitor the project ROW for establishment of Monarch butterfly overwintering sites prior to and during construction throughout the overwintering period. **Reporting:** Monthly, if overwintering sites are	The D-B Contractor will be contractually bound to comply with this requirement.

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overwintering site.						identified for the duration of construction.	
BIO-1j: Avoid nesting birds and bats during vegetation maintenance. • Implement the Worker Environmental Awareness Training Program described under Mitigation Measure BIO-1a: Implement general biological impact avoidance measures. • Annual vegetation maintenance will be performed between September 1 and January 30, wherever feasible to avoid nesting and roosting seasons. • If vegetation maintenance needs to occur between February 1 and August 31 in the ESZ, then JPB will retain a qualified biologist to conduct preclearance surveys for nesting migratory birds, including raptors, and roosting bats. If active nests or roosts are found during the survey, no-disturbance species-specific buffer zones will be established by a qualified biologist and marked with high-visibility fencing, flagging, or pin flags. If an active Townsend's big-eared bat roost is found, consultation with CDFW will be conducted to determine appropriate avoidance strategies. Vegetation clearance will then occur after the nesting or roosting activity has ended. If vegetation clearance is necessary due to an emergency, it may proceed as necessary.	**Implementing Party:** Qualified Biologist, JPB, and Rail Operations Contractor **Reporting Party:** Qualified Biologist **Monitoring Party:** JPB		**X**		**X**	**Implementation:** Preconstruction surveys will be conducted prior to construction and annually if maintenance activities are scheduled between February 1 and August 31. **Reporting:** Following each survey; in the event maintenance activities are scheduled between February 1 and August 31 for the duration of construction; and following maintenance activities during operation of the project if maintenance activities are scheduled between February 1 and August 31.	Worker Environmental Awareness Training Program. Annual Vegetation Maintenance Plan prepared and maintained by JPB.
BIO-2: Implement serpentine bunchgrass avoidance and revegetation measures. • The area of the alignment through Communications Hill in San Jose will be surveyed by a qualified botanist during the design phase. • If serpentine bunchgrass grassland is identified, OCS pole placement will be designed to minimize permanent loss of this community. • Where this community is temporarily disturbed by construction, the disturbed area will be revegetated with serpentine bunchgrass grassland. • Where this community is permanently disturbed by permanent facilities, an area of equal size will be planted with serpentine bunchgrass grassland species and maintained and monitored until self-sufficient without intervention. Planting will occur at a location with suitable soils to support this community. The planting location will be as near as possible to the impact area within the Communications Hill area.	**Implementing Party:** Qualified Botanist and D-B Contractor **Reporting Party:** Qualified Botanist **Monitoring Party:** JPB	**X**	**X**	**X**		**Implementation:** Qualified Botanist will survey alignment for serpentine bunchgrass prior to final design and will prepare Revegetation Plan, as necessary. **Reporting:** Prior to final design and throughout the duration of construction, as needed. If revegetation done, then post-planting reporting until success determined.	The D-B Contractor will be contractually bound to comply with this requirement. Qualified Botanist will establish and monitor revegetated serpentine bunchgrass grassland as needed.
BIO-3: Avoid or compensate for impacts on wetlands and waters. • Wetlands and waters will be avoided as required by Mitigation Measure BIO-1a, where feasible. • If wetlands and waters cannot be avoided, then JPB will compensate for any permanent losses on a minimum 1:1 ratio (or at a greater ratio if determined to be required in permitting by the USACE or San Francisco Regional Water Quality Control Board [SFRWQCB]). Compensation will be provided by either creation of wetlands or waters to replace those losses and/or enhancement of existing waters or wetlands and/or purchase of adequate credits from a mitigation bank approved by USACE and SFRWQCB.	**Implementing Party:** Qualified Biologist in coordination with USACE and/or SFRWQCB **Reporting Party:** Qualified Biologist **Monitoring Party:** JPB	**X**	**X**	**X**		**Implementation:** Following completion of final design, JPB will compensate for any permanent losses prior to construction. **Reporting:** Following final design.	Permit requirements established by USACE and/or SFRWQCB. Compensation and/or Restoration Plan.
BIO-5: Implement Tree Avoidance, Minimization, and Replacement Plan. A Tree Avoidance, Minimization, and Replacement Plan will be developed in consultation with a certified arborist and in consultation with cities, counties, and affected property owners along the project route. A complete field survey of the entire project area will be completed to support plan development by preparing a tree inventory for all affected areas. The plan will contain the following provisions.	**Implementing Party:** Certified Arborist, D-B Contractor, and JPB **Reporting Party:** Certified Arborist **Monitoring Party:** JPB	**X**	**X**	**X**		**Implementation:** Certified Arborist will develop a Tree Avoidance, Minimization, and Replacement Plan prior to construction. **Reporting:** Reporting prior to construction; monthly throughout construction. Reporting of annual monitoring or replanted trees.	Tree Avoidance, Minimization, and Replacement Plan prepared by a Certified Arborist.

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• The definition of what is and is not a "tree" for the purposes of this mitigation shall be the same definition used in Appendix F, Tree Inventory and Canopy Assessment, which is based on the "tree" definition in each municipality. • During the design phase, JPB will assess the potential to modify OCS pole alignment and other facility design to avoid and/or minimize the amount of tree removal or pruning necessary consistent with maintenance, operational, and safety requirements. This may include changes in horizontal alignment of OCS poles, changes in pole design (such as use of center poles, two-track cantilevers, portals, or offset insulator poles and placement of energized elements on the trackside of OCS poles where consistent with construction maintenance, operational, and safety requirements). JPB will consult with each jurisdiction (including the jurisdictions' arborist as appropriate) along the route during the design phase to identify where tree removals can and cannot be avoided with project design measures and methods to minimize pruning.[1] • Prior to construction, a professional arborist will assess the potential effects to non-removed individual tree roots, including root pruning due to trenching of underground utilities and soil compaction at TPFs, to determine if these activities may jeopardize the health of affected trees. If tree health for trees not planned for removal is compromised substantially such that the tree may die, mitigation would occur at the ratios specified in this measure. • During construction, trees not scheduled for removal will be protected using barrier fencing. • Tree pruning during construction will be done in accordance with arboricultural industry recommended practices. Pruning specifications will also follow American National Standards Institute (ANSI) A300 Standards and International Society of Arboriculture (ISA) Best Management Practices. Tree planning near walkways will be consistent with California Public Utilities Commission (CPUC) General Order 118. • Special care will be taken to minimize construction period effects on El Palo Alto including minimization of any pruning. Pruning of El Palo Alto, if necessary, will be coordinated with the City of Palo Alto arborist, in advance. • If pruning will result in the loss of 25 percent or more of an individual tree's canopy, then JPB will consider the tree removed and it will be replaced consistent with the replacement requirements described below. o For trees removed outside of the Caltrain ROW: ▪ Where specific replacement ratios or specifications are provided in the local tree ordinance or guidance (in the Cities of South San Francisco, San Bruno, San Mateo, Belmont, San Carlos, Atherton, Menlo Park, Palo Alto , Sunnyvale and Santa Clara County), Caltrain will replace protected trees using the local requirements (as specifically described in Appendix F, Attachment 1). ▪ Where specific replacement ratios or specifications are not provided in local tree ordinances (in the Cities of San Francisco, Brisbane, Millbrae, Burlingame, Redwood City, Mountain View, Santa Clara, and						

[1] The JPB will work with the City of San Carlos to determine whether to include the trees to be planted at the Transit Village in replacement requirements. If the trees are not planted by the time of the PCEP construction or do not fall within the ESZ, then there would be no reason to include them in the tree count as these trees would not be removed or trimmed.

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San Jose, and in San Mateo County, as specifically described in Appendix F, Attachment 1), Caltrain will replace protected trees on a 2:1 basis using 15-gallon trees (i.e., two 15-gallon trees would be planted to each protected tree removed). ▪ For non-protected trees in all locations outside the ROW, Caltrain will replace trees on a 1:1 basis using 15-gallon trees (i.e., one 15-gallon tree would be planted for each non-protected tree removed). o For trees within the Caltrain ROW, the following requirements will be followed: ▪ Protected trees will be replaced on a 1:1 basis using 15-gallon trees (i.e., one 15-gallon tree would be planted to every tree removed), where feasible. Non-protected trees will be replaced on the same basis. o Trees will be replaced, wherever possible, to provide visual screening of the ROW at locations where tree removal or pruning occurs due to the project. o On-site replanting will be the first priority, where feasible and consistent with railroad operations, maintenance, and safety. o Trees will be replaced with a tree of the same species wherever possible, unless that species in a non-native invasive species (see discussion below). Alternative species to the tree removed may be planted with concurrence of the landowner and local municipality. Within the Jules Francard Grove in Burlingame any replanting will consist of blue gum trees to be consistent with the historic plantings. Replacement eucalyptus species, with the exception of red river gum, can be utilized as part of this mitigation. o If on-site tree replacement cannot occur on the Caltrain ROW (where trees are removed from the ROW) or on adjacent property (where trees are removed outside of the ROW), then tree replacement will occur on other parts of the affected property (with concurrence of the land owner) or other parts of the local area (with concurrence of the local municipality). Alternatively, JPB will pay into a local urban forestry fund to support local tree planting programs, provided JPB and local municipalities can agree on the appropriate fund and amount. The replacement requirements described above will apply in determining the equivalent funding amount. • Consistent with Executive Order 13112 on invasive species, when JPB is replacing trees within its ROW, JPB will use native tree species insofar as it is practicable. Within the Caltrain ROW, JPB will not plant invasive tree species as defined by the Invasive Species Council of California (http://ice.ucdavis.edu/invasives/). For replacement of trees outside the Caltrain ROW, JPB will replant (or pay for others to replant) trees that are desired by the landowner or local municipality. Landowners may prefer that replacement trees be non-native trees to match non-native trees that were removed or to match surrounding vegetation. • The JPB will be responsible to provide maintenance and monitoring of all replanted trees to assure their survival and/or remedial replanting in case they do not survive. o All replanted trees will be maintained for a minimum 5-year period and monitored on an annual basis by a professional arborist. o If at the end of 5 years, the tree is considered successfully established, then no								

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further maintenance is required by the JPB. A professional arborist shall make the determination as to planting success. o The JPB will be directly responsible for maintaining all trees within the JPB ROW. o For trees outside the JPB ROW, the JPB will be responsible for maintenance costs for the first five years. If individual tree plantings are determined to be unsuccessful after five years, then the JPB will be required to either replace the tree (and provide an additional 5 years of maintenance) and/or extend the maintenance period on a year to year basis until the tree is successfully established. If the tree planting is successfully established, then all further maintenance will be responsibility of the landowner.							
BIO-6: Pay *Santa Clara Valley Habitat Plan* land cover fee (if necessary). If it is determined that the SCVHCP applies to the Proposed Project, JPB will pay any required compensation fees prior to construction. It is expected that fee payment will only be required in relation to TPS2, Option 1 (burrowing owl fee) and the area along the alignment disturbed for OCS installation south of PS7 (potential payment of land cover fee and serpentine fee).	**Implementing Party:** Qualified Biologist and JPB **Reporting Party:** JPB **Monitoring Party:** JPB	X				**Implementation:** Qualified Biologist will determine if SCVHP applies to the Proposed Project prior to project construction. **Reporting:** No reporting required following fee assessment and payment (if applicable).	Compensation fees to SCVHP if applicable.
CUL-1a: Evaluate and minimize impacts on structural integrity of historic tunnels. A structural investigation shall be conducted prior to the removal of any historic fabric to evaluate probable effects on each tunnel's structural integrity, followed by the development of a design approach and construction methods to avoid affecting structural integrity. While the notching would remove historic fabric, retained structural integrity will ensure that this historic method of construction will retain integrity.	**Implementing Party:** D-B-B Tunnel Contractor and Qualified Architectural Historian **Reporting Party:** Qualified Architectural Historian **Monitoring Party:** JPB	X				**Implementation:** D-B Tunnel Contractor will retain a qualified engineer to conduct a structural investigation and develop a design approach to avoid affecting structural integrity prior to any removal of historic fabric. **Reporting:** Prior to final design and following construction.	The D-B-B Tunnel Contractor will be contractually bound to comply with these requirements.
CUL-1b: Minimize impacts on historic decorative tunnel material. Prior to any removal of decorative tunnel portal material during crown mining of historic Tunnels 1, 3, and 4, a structural investigation shall be conducted to evaluate the probable effects on the structural integrity of the tunnel portals. Also prior to the removal of the historic material, depending upon the extent of the material to be removed, the portal may be recorded to the Historic American Engineering Record (HAER) standards level III (refer to http//www.nps.gov/history/hdp/). Additionally, also depending upon the extent of the material to be removed, the Secretary of the Interior's standards (SOIS) for the rehabilitation of historic properties may be followed in the design and implementation of the adaptation of the tunnels to accommodate the larger rolling stock (refer to http//www.nps.gov/tps/standards.htm). A structural investigation shall be conducted to identify construction disturbance to the decorative portals. If it is determined that more than 4 inches of material must be removed from the portals of any of the tunnels, a visual simulation depicting the removal shall be prepared to assess the visual impacts and to determine if the portal(s) will need to be recorded according to HAER standards and if the SOIS need to be applied. If the maximum amount of material to be removed is 4 inches or less, removal of the decorative tunnel material shall be "feathered" from the maximum removal at the keystone to the sides of the tunnels, maintaining the round arch.	**Implementing Party:** D-B-B Tunnel Contractor and Qualified Architectural Historian **Reporting Party:** Qualified Architectural Historian **Monitoring Party:** JPB	X				**Implementation:** D-B Tunnel Contractor will retain a qualified engineer to conduct a structural investigation prior to any removal of decorative tunnel portal material. **Reporting:** Prior to final design and following construction.	SOIS standards may be followed in the design and implementation of tunnel adaptation depending on the extent of material removed. The D-B Tunnel Contractor will be contractually bound to comply with these requirements.
CUL-1c: Install project facilities in a way that minimizes impacts on historic tunnel interiors. The OCS design for the tunnels shall minimize the removal of historic brick fabric as much as is	**Implementing Party:** D-B-B Tunnel Contractor and Qualified Architectural Historian	X				**Implementation:** D-B-B Tunnel Contractor Design will incorporate these requirements into the final design.	The D-B-B Tunnel Contractor will be contractually bound to comply with these requirements.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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feasible. Power system supports for the Proposed Project inside Tunnels 1, 2, 3 and 4 shall be placed sufficiently far back to not be readily visible, and attached to the tunnels' interiors in shotcrete instead of historic brick. At Tunnels No. 1, 2, and 3, the OCS shall be attached to the interior roof surface of the tunnel by brackets inserted into shotcrete. In addition, pole sets shall be installed at the portals of each tunnel. For Tunnel Nos. 1–3, side poles at the portals shall be used with power systems over the individual tracks that the poles power. The brackets within the tunnel interiors shall be set inside the tunnel mouth sufficiently far back that they would not be readily visible to passers-by or to those standing on the passenger platforms. At Tunnel No. 4, the system shall also be attached to the interior roof surface of the tunnel by brackets inserted into shotcrete. In addition, pole sets shall be installed at the portals of each tunnel. The brackets within the tunnel interiors shall be set inside the tunnel mouth sufficiently far back that they will not be readily visible to passers-by or to those standing on the passenger platforms (particularly at Tunnel No. 4's southern portal, the Bayshore Station).	**Reporting Party:** Qualified Architectural Historian **Monitoring Party:** JPB					**Reporting:** Prior to final design and following construction.	
CUL-1d: Implement design commitments at historic railroad stations **Millbrae Station** Side poles shall not be placed in front of or within 40 feet of the historic station on the west side of the Caltrain ROW. In addition, to minimize the visual intrusion of the poles, one of the following arrangements will be used for areas along the alignment within 100 feet on either side of the historic station: • center pole/two-track cantilevers between MT1 and MT2 with side poles for the Millbrae siding, or • a two-track cantilevers east of MT2 covering MT2 and MT1 with side poles for Millbrae siding. Additionally, prior to the installation of the OCS, the station will be recorded to HABS level III standards from the track side of the building, from the opposite platform. **Burlingame Station** Side poles shall not be placed in front of or within 40 feet of historic station on the west side of the Caltrain ROW. In addition, to minimize the visual intrusion of the poles, one of the following arrangements will be used for areas along the alignment within 100 feet on either side of the historic station: • center pole/two–track cantilevers; or • two-track cantilevers from the east side platform. Additionally, prior to the installation of the OCS, the significant portions of the property (i.e., the baggage room, waiting room, and the station master living quarters which together make up the current station) will be recorded to HABS level III standards from the track side of the building, from the opposite platform. **Atherton Station** Side poles shall not be placed in front of or within 40 feet of historic station on the west side of the Caltrain ROW. In addition, to minimize the visual intrusion of the poles, within 100 feet on either side of the historic station, one of the following shall be used:	**Implementing Party:** D-B Contractor and Qualified Architectural Historian **Reporting Party:** Qualified Architectural Historian **Monitoring Party:** JPB	**X**				**Implementation:** Qualified Architectural Historian will record stations to HABS level III standards and pole placement will be designed to minimize visual impact to historic stations prior to construction. **Reporting:** Prior to final design and following construction.	Design will be developed to comply with requirements regarding pole placement and visual intrusion on historic stations.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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• center pole/two–track cantilevers; or • single cantilevers in the median between the two tracks. Additionally, prior to the installation of the OCS, the station will be recorded to HABS level III standards from the track side of the building, from the opposite platform. **Menlo Park Station** Side poles shall not be placed in front of or within 40 feet of historic station on the west side of the Caltrain ROW. In addition, to minimize the visual intrusion of the poles, one of the following arrangements will be used for areas along the alignment within 100 feet on either side of the historic station: • center pole/two–track cantilevers; or • two-track cantilevers from the east side platform. Additionally, prior to the installation of the OCS, the station will be recorded to HABS level III standards from the track side of the building, from the opposite platform. **Palo Alto Station** Side poles shall not be placed in front of or within 40 feet of historic station on the west side of the Caltrain ROW. Given the separation between MT1 and MT2, single center poles are not feasible. Thus, to minimize visual impacts on the property, single pole/cantilevers will be placed in the median between MT1 and MT2. Additionally, prior to the installation of the OCS, the station will be recorded to HABS level III standards from the track side of the building, from the opposite platform. **Santa Clara Station and the Station Tower** Side poles shall not be placed in front of or within 40 feet of historic station or the other historic structures (control tower, etc.) on the west side of the Caltrain ROW. Poles in front of the historic station should be center pole single cantilevers for MT2 and MT3 where parallel to the historic station. Side poles can be used for MT1 and placed on the modern center platform. Side poles on the western side of the ROW shall be located near non-historic features, to the extent feasible as follows: • A pole at the northern end of the station can be located near the modern steel and glass passenger waiting shelter. • A pole at the southern end of the station can be sited east of the old set of tracks nearest the historic station (retained as an example of the relationship of the station to the original line and no longer operative) set in the modern poured concrete passenger platform and located among the modern electroliers on this platform. • Poles shall not be located near the speeder shed or the utility shed. • Poles can be located to each side of the control tower, one between the tower and the stub of Benton Street, the other more than 50 feet to the north. Additionally, prior to the installation of the OCS, the station will be recorded to HABS level III standards from the track side of the building, from the opposite platform. **San Jose Diridon Station**							

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At the San Jose Diridon Station the OCS design shall utilize a headspan. No poles shall be installed within the butterfly shelters between Tracks 2 and 3 and between Tracks 4 and 5.							
CUL-1e: Implement specific tree mitigation considerations at two potentially historic properties and landscape recordation, as necessary. Access to properties at 45 and 51 Mount Vernon Lane in Atherton needs to be gained and historic resources evaluation completed prior to the removal of vegetation. If either of the residences proves to be CRHR-eligible, and the trees requiring removed for the project are character-defining features from the historic period of significance, or if the removal of the vegetation has the potential to visually impact the historic property, the preparation of specific tree avoidance, minimization, and/or compensation plans pursuant to Mitigation Measure BIO-5 shall take into account the historic character of the properties. If avoidance or minimization is not feasible, then replanting shall be conducted on the properties, if feasible. Regardless of the tree mitigation implemented, if the properties are determined to be CRHR-eligible, then the JPB shall have a qualified architectural historian record the landscape using Historic American Landscape Survey Standards level 3 prior to any project vegetation removal.	**Implementing Party:** D-B Contractor and Qualified Architectural Historian **Reporting Party:** Qualified Architectural Historian **Monitoring Party:** JPB	**X**	**X**			**Implementation:** Qualified Architectural Historian will assess impacts to potential historic structures prior to construction. **Reporting:** Prior to final design and following construction.	Design will be developed to comply with requirements.
CUL-1f: Implement historic bridge and underpass design requirements. This mitigation measure addresses the approach to installing Proposed Project facilities at nine historic bridges/underpasses to ensure that the power system supports are not attached to the historic fabric of these bridges/underpasses and avoid adverse impacts on their historic integrity and visual appearance. All modifications will be completed following the Secretary of the Interior's standards for the treatment of historic properties. **Airport Boulevard Underpass or South San Francisco Subway** Rather than installing the power system directly onto the bridge, power cables shall be suspended parallel to and above it to ensure that the bridge will not be impacted. **San Francisquito Bridge, Palo Alto** The OCS cables shall be suspended from the upper portions of the San Francisquito Creek Bridge truss. The power cables shall use fasteners and brackets to support the power lines. The brackets shall be attached to the existing structure, but no part of the existing structure shall be removed as a part of the Proposed Project. Installation of the main support brackets shall require no permanent modification to the bridge structure and shall be completely removable. Installation of the static wire grounding brackets will require site drilling of eight 5/8 inch diameter clearance holes, with the brackets completely removable. No poles shall be set on the bridge itself.	**Implementing Party:** D-B Contractor and Qualified Architectural Historian **Reporting Party:** Qualified Architectural Historian **Monitoring Party:** JPB	**X**				**Implementation:** Requirements will be specified in design-build contracts and incorporated into final design. **Reporting:** Prior to final design and following construction.	The D-B Contractor will be contractually bound to comply with these requirements.

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University Avenue Underpass, Embarcadero Underpass, Palo Alto Power cables shall be suspended parallel to and above the University Avenue Underpass. The poles in this configuration shall be set at the side of the track they power. No poles shall be set on the bridges themselves. **Alameda Underpass, San Jose** Power cables shall be suspended parallel to and above the Alameda Underpass. No poles shall be set on the bridge itself.							
CUL-2a: Conduct an archaeological resource survey and/or monitoring of the removal of pavement or other obstructions to determine if historical resources under CEQA or unique archaeological resources under PRC 21083.2 are present. Prior to the start of construction or future construction activities, the JPB and/or the construction contractor shall retain qualified archaeologists to conduct a pedestrian archaeological survey to determine the prehistoric, ethnographic, and historic archaeological resources within areas proposed for disturbance within the Archaeological Study Area and within those areas outside of the Archaeological Study Area established for OCS pole placement and vegetation maintenance. In those areas covered with pavement or other obstructions, a qualified archaeologist shall monitor removal of the obstruction (and any underlying base, foundations, etc.) and inspect the ground for cultural materials.	**Implementing Party:** Qualified Professional Archaeologist and JPB or the D-B Contractor **Reporting Party:** Qualified Archaeologist **Monitoring Party:** JPB	X				**Implementation:** Qualified Professional Archaeologist will conduct a pedestrian archaeological survey prior to construction. Monitoring of any removals. **Reporting:** Prior to construction.	Pedestrian archaeological survey report.
CUL-2b: Conduct exploratory trenching or coring of areas where subsurface project disturbance is planned in those areas with "high" or "very high" potential for buried site. In those areas with "high" or "very high" potential for buried sites, a qualified archaeologist shall conduct exploratory trenching or coring of areas where subsurface project disturbance is planned, prior to that disturbance. Any cultural resources discovered during exploratory trenching or coring shall be protected or evaluated. Evaluation shall follow the research design and recommendation presented in the *Data Recovery and Late Discoveries Treatment Plan for the Caltrain Electrification Program Alternative: San Francisco, San Mateo, and Santa Clara Counties, California* (Far Western Anthropological Research Group 2009).	**Implementing Party:** Qualified Professional Archaeologist and the JPB or the D-B Contractor **Reporting Party:** Qualified Archaeologist **Monitoring Party:** JPB	X				**Implementation:** Qualified Professional Archaeologist will conduct exploratory trenching or coring of areas with "high" or "very high" potential for buried sites prior to construction. **Reporting:** Prior to construction.	D-B Contractor will be required to protect or evaluate any cultural resources discovered.
CUL-2c: Conduct limited subsurface testing before performing ground-disturbing work within 50 meters of a known archaeological site. When avoidance of impacts is not feasible, a qualified professional archaeologist shall conduct limited subsurface testing before any ground-disturbing project work is done within 50 meters of a known archaeological site. The objectives of the testing shall be to delineate the extent and depth of the site within the Archaeological Study Area and within those areas outside of the Archaeological Study Area established for OCS pole placement and vegetation maintenance; determine whether human remains are present within the Archaeological Study Area; and assess the nature and potential significance of the archaeological deposit within the Archaeological Study Area. The work shall be guided by the *Data Recovery and Late Discoveries Treatment Plan for the Caltrain Electrification Program Alternative: San Francisco, San Mateo, and Santa Clara Counties, California* (Far Western Anthropological Research Group 2009). All testing within a prehistoric or ethnographic site (including Mission-era sites) shall include consultation with the local Native American community.	**Implementing Party:** Qualified Professional Archaeologist in consultation from local Native American community and D-B Contractor **Reporting Party:** Qualified Archaeologist **Monitoring Party:** JPB	X				**Implementation:** Qualified Professional Archaeologist, in consultation with the local Native American community, will conduct limited subsurface testing before any ground-disturbing project work is done within 50 meters of a known archaeological site. **Reporting:** Archeological sites will be identified and reported prior to construction.	D-B Contractor will be required to protect or evaluate any cultural resources discovered from limited subsurface testing within 50 meters of a known archaeological site.
CUL-2d: Conduct exploratory trenching or coring of areas within the three zones of special sensitivity where subsurface project disturbance is planned. If any ground-disturbing project work is planned within the three zones of special sensitivity (the	**Implementing Party:** Qualified Professional Archaeologist and D-B Contractor	X				**Implementation:** Qualified Professional Archaeologist will conduct exploratory trenching or coring of areas within zones of special sensitivity where subsurface project	Archaeological investigations report.

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Hamilton shell mound zone, the vicinity of the Third Mission Santa Clara, and Tamien Station), a qualified archaeologist shall conduct exploratory trenching or coring of areas where subsurface project disturbance is planned, prior to that disturbance. Any cultural resources discovered during exploratory trenching or coring shall be protected or evaluated. Archaeological investigations in the vicinity of the archaeological preserve at the Third Mission (CA-SCL-30/H) should be guided by the recommendations presented by Allen et al. (2003) or by anticipated updates to that document. Archaeological investigations in the other two zones of special sensitivity shall be guided by the *Data Recovery and Late Discoveries Treatment Plan for the Caltrain Electrification Program Alternative: San Francisco, San Mateo, and Santa Clara Counties, California* (Far Western Anthropological Research Group 2009).	**Reporting Party:** Qualified Archaeologist **Monitoring Party:** JPB					disturbance is planned, prior to ground disturbance. **Reporting:** Report regarding findings of trenching and coring will be completed prior to ground-disturbance.	
CUL-2e: Stop work if cultural resources are encountered during ground-disturbing activities. The JPB shall ensure the construction specifications include a stop work order if prehistoric or historic-period cultural materials are unearthed during ground-disturbing activities. All work within 50 feet of the find shall be stopped until a qualified archaeologist and Native American representative can assess the significance of the find. Prehistoric materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or tool making debris; culturally darkened soil ("midden") containing heat-affected rocks and artifacts; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered-stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. If the find is determined to be potentially significant, the archaeologist, in consultation with the Native American representative, shall develop a treatment plan that could include site avoidance, capping, or data recovery.	**Implementing Party:** Qualified Professional Archaeologist, local Native American representative, and D-B Contractor **Reporting Party:** Qualified Archaeologist **Monitoring Party:** JPB	**X**	**X**			**Implementation:** Work will stop if prehistoric or historic-period cultural materials are unearthed during ground-disturbing activities until a Qualified Professional Archaeologist and local Native American representative can assess the significance of the find. **Reporting:** Monthly during ground disturbing activities.	Upon discovery of or historic-period cultural materials, a treatment plan that could include site avoidance, capping, or data recovery will be developed by the Qualified Professional Archeologist, in consultation with the local Native American representative.
CUL-2f: Conduct archaeological monitoring of ground-disturbing activities in areas as determined by JPB and SHPO. Even though data recovery would, in theory, collect all potentially significant materials and information from the impact zone, in practice it is not feasible to do archaeological excavation of the entire area. This is particularly true in highly urbanized areas such as this project corridor. Therefore, at the discretion of JPB and the SHPO, it may be necessary to monitor project operations within recorded site boundaries. Activities to be monitored would include, but are not necessarily limited to, brush clearing, grading for stations, pavement removal, placement of electrification poles and utilities, and any activity involving subsurface excavation. The monitor(s), in consultation with the construction supervisor, would have authority to halt construction activities temporarily in the immediate vicinity of an unanticipated find to assess the significance of the find. Whether or not a monitor is present, the construction supervisor and work crews should be alert to the possibility of additional cultural or human remains being unearthed. If this occurs, all work should stop temporarily within 50 feet of the find until a qualified professional archaeologist can be called in to assess the find and determine the proper course of action.	**Implementing Party:** D-B Contractor and Archaeological Monitor **Reporting Party:** Qualified Archaeologist **Monitoring Party:** JPB		**X**			**Implementation:** Archaeological Monitor will monitor construction activities, as determined necessary by JPB and SHPO, and temporarily halt construction activities if potentially significant materials and information are uncovered. **Reporting:** Monthly during ground disturbing activities.	The D-B Contractor will be contractually bound to comply with these requirements.
CUL-3: Comply with state and county procedures for the treatment of human remains discoveries. Any human remains and related items discovered during the implementation of the terms of the PA prepared for this project shall be treated in accordance with the requirements of Section 7050.5(b) of the California Health and Safety Code. If, pursuant to Section 7050.5(c) of the California Health and Safety Code, the county coroner/medical examiner determines that the human remains are or may be of Native American origin, then the discovery shall be treated in	**Implementing Party:** D-B Contractor and JPB **Reporting Party:** D-B Contractor **Monitoring Party:** JPB		**X**			**Implementation:** D-B Contractor will comply with requirements of Section 7050.5(b) of the California Health and Safety Code if any discovered human remains are discovered during construction. **Reporting:** Monthly during construction.	The D-B Contractor will be contractually bound to comply with these requirements.

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accordance with the provisions of Section 5097.98(a)-(d) of the California Public Resources Code. The JPB shall ensure that the remains are not damaged or disturbed further until all stipulations in Section 7050.5 and Section 5097.98 have been met.							
EMF-2: Minimize EMI effects during final design, Monitor EMI effects during testing, commission and operations, and Remediate Substantial Disruption of Sensitive Electrical Equipment. The potential for EMI effects shall be minimized by ensuring that all electronic equipment is operated with a good electrical ground and that proper shielding is provided for electronic system cords, cables, and peripherals. Installing specialized components, such as filters, capacitors, and inductors, can also reduce EMI susceptibility of certain systems. The design of the system will consider and incorporate, where practicable, the latest standards relevant to minimizing the effects of EMI on other systems, including the Caltrain and BART signal systems. During final design, detailed analyses shall be undertaken to determine the specific levels of any voltages that could be induced onto paralleling longitudinal conductors and, if significant voltages were to be identified, mitigation measures shall be developed in accordance with the relevant industry accepted IEEE and/or MIL (Military) standards. The final design shall utilize proven technologies for catenary system components, and the technical specifications shall be written to assure that damage during construction to the conductors or hardware will be minimized to the greatest extent practicable. Proven design standards have been developed and shall be followed to mitigate any identified effects. For instance, the NEC installed 25 kV electrification system, counter poise ground wires were installed in some locations, and additional bonding between the aerial ground conductors was used as well. The specific design features shall be developed during final design, in accordance with the published standards. Union Pacific, SCVTA and BART operate sensitive electric equipment in or adjacent to the right-of-way. The following are required to ensure that significant EMI effects to the freight and passenger rail signal systems and operations are avoided: • The JPB shall work with Union Pacific, SCVTA, BART and other rail operators during project design to ensure that signal systems and other sensitive electric equipment for other freight or passenger rail facilities are not disrupted by EMI from the PCEP OCS. The JPB shall provide plans for controlling EMI levels near Union Pacific, SCVTA, and BART facilities for review and input. • EMI levels shall be evaluated during testing and commissioning period for the Project and the JPB shall coordinate with Union Pacific SCVTA and BART to evaluate whether any interference effects occur to sensitive electric equipment. Where interference is detected that disrupt operations of this equipment, the JPB shall remedy the disruption prior to revenue operations. • After commissioning, EMI impacts shall be monitored during the first year of project operation on at least a quarterly and reporting shares with Union Pacific, SCVTA, and BART. Andy identified disruption of electric equipment shall be immediately remedied. • If at any time, PCEP operation causes EMI interfering with signaling, automatic grade crossing warning devices, train control or other equipment necessary for safe and reliable operation of freight and passenger trains in the corridor, the JPB shall require shutdown and modification of the PCEP electrical system in the affected area and shall eliminate any disruption identified,	**Implementing Party:** D-B Contractor and JPB in coordination with local cities, BART, UCSF, France Telecom, Health Diagnostics, Valley Radiological, Palo Alto Medical Foundation, St. Jude Medical Center, Evans Analytical, Motorola and Intel **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	**X**	**X**	**X**		**Implementation:** EMI effects will be minimized with incorporation of the latest standards relevant to minimizing the effects of EMI during the design phase. **Reporting:** Prior to final design, construction, and post-construction.	Latest standards relevant to minimizing the effects of EMI will be implemented to all electronic equipment. EMF monitoring post-construction.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
• The JPB shall be responsible for all costs to evaluate, design, monitor, and remediate any project-related EMI disruption of sensitive electric equipment of other passenger or freight rail systems. For non-rail systems, the following will be required: • The JPB will make a good faith effort to coordinate with local cities, BART, UCSF, France Telecom, Health Diagnostics, Valley Radiological, Palo Alto Medical Foundation, St. Jude Medical Center, Evans Analytical, Motorola and Intel (and any other facilities located adjacent to the ROW with sensitive equipment and requesting such consultation) to determine whether their facilities would be susceptible to EMI effects. • During final design, the JPB shall evaluate the specific EMI levels associated with the PCEP system at the identified sensitive facilities and determine the appropriate controls necessary to avoid disruption of sensitive equipment prior to testing and commissioning of the system. • EMI levels shall be evaluated during testing and commissioning period for the Project and the JPB shall coordinate with the identified sensitive facilities to evaluate whether any substantial interference effects are occurring due to system operation. Where substantial interference is detected that disrupt operations of sensitive electric equipment, the JPB shall remedy the disruption prior to commissioning of electrified operations through EMF controls and/or shall provide shielding of sensitive equipment. • After commissioning, EMI impacts shall be monitored during the first year of project operation and reporting shared with any of the identified sensitive facilities. Any identified disruption of sensitive electric equipment shall be immediately remedied. • If the PCEP operations causes substantial EMI interference with sensitive electric equipment during, the JPB shall identify and eliminate the substantial interference through additional EMF control measures and/or provide shielding for the sensitive equipment. The JPB shall be responsible for all costs to evaluate, design, monitor, and remediate any project-related EMI disruption of sensitive electric equipment.							
GEO-1: Perform a site-specific geotechnical study for traction power facilities. Prior to final design, the JPB will ensure that a qualified geologist will prepare a design-level geotechnical investigation for all TPFs. The investigation will include subsurface soil sampling, laboratory analysis of samples collected to determine soil characteristics (including identifying and defining the limits of unstable, compressible, and collapsible soils), and an evaluation of the laboratory testing results by a geotechnical engineer. Recommendations based on the results will be used in the design specifications for the proposed TPF structures. The report will include recommendations typical to avoid potential risks associated with seismic groundshaking and liquefaction, in accordance with the specifications of California Geological Survey's Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California, and the requirements of the Seismic Hazards Mapping Act. This report will also identify thickness and distribution of compressible materials, anticipated amounts of total and differential settlement, and tolerance of the structure(s) for displacement of soils. Following identification and delineation of compressible and collapsible soils, the JPB and qualified geologists will identify recommendations for building on compressible soils, which may include the following measures. • Surcharging of compressible fine-grained soils prior to construction to reduce anticipated post-construction settlements to acceptable levels or use of deep	**Implementing Party:** D-B Contractor and Qualified Geologist **Reporting Party:** Qualified Geologist **Monitoring Party:** JPB	**X**				**Implementation:** The D-B Contractor and Qualified Geologist will prepare a design-level geotechnical investigation for all TPFs during the design phase and prior to construction. **Reporting:** Prior to final design.	Geotechnical investigation prepared by Qualified Geologist.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
foundations to support improvements in non-compressible soil strata. • Removal and/or compaction of collapsible granular soils and non-compacted fills before placing fill to reduce anticipated post-construction settlements to acceptable levels. • Deep-dynamic compaction, rapid impact compaction, vibro-compaction or stone columns.							
GEO-4a: Identification of expansive soils. Before submission of final grading plans, the JPB will retain a qualified geotechnical engineer and engineering geologist. The geologist/engineer will conduct field observations and testing of onsite soils and formations to identify and define the limits of expansive materials. A final report will be prepared and submitted to all appropriate agencies. This report will include identification of thickness and distribution of the expansive materials, anticipated depth of moisture variation, expansiveness of the earth materials, structure tolerance for displacement, and confirmation or modification of mitigation measures for expansive materials.	**Implementing Party:** Qualified Geotechnical Engineer and D-B Contractor **Reporting Party:** Qualified Geotechnical Engineer and Qualified Geologist **Monitoring Party:** JPB	**X**				**Implementation:** Qualified Geotechnical Engineer will identify expansive soils prior to grading. **Reporting:** Prior to grading.	Geotechnical Report on Expansive Soils.
GEO-4b: Mitigation of expansive soils. Following identification and delineation of expansive materials, the geologist engineer will identify the most appropriate methods of mitigation. Mitigation measures can include the following measures. • Excavation and replacement with non-expansive fill materials. • Design building foundations to limit foundation deflections from expansive soil movement. This could include heavy conventional mat or post-tensioned slab foundations, heavy reinforced grid footings, or pier and grade beam foundations.	**Implementing Party:** Qualified Geotechnical Engineer and D-B contractor **Reporting Party:** Qualified Geotechnical Engineer and Qualified Geologist **Monitoring Party:** JPB	**X**				**Implementation:** Qualified Geotechnical Engineer will develop mitigation measures for expansive soils prior to grading. **Reporting:** Prior to foundation work and post-installation.	Geotechnical Report on Expansive Soils.
HAZ-2a: Conduct a Phase II Environmental Site Assessment prior to construction. Prior to construction, a Phase II Environmental Site Assessment (ESA) will be prepared for portions of the proposed Project located within areas with a high likelihood of contaminated media by a qualified environmental consultant. The Phase II ESA will include but not be limited to the following. • A scope of work consisting of Pre-Field Activities, such as preparation of a Health and Safety Plan (HASP), marking boring locations and obtaining utility clearance, and Field Activities, such as identifying appropriate sampling procedures, health and safety measures, chemical testing methods, and quality assurance/quality control (QA/QC) procedures in accordance with the ASTM Standard. o The HASP will include, but is not limited to; ▪ Potential project hazards analysis ▪ Personal Protective Equipment (PPE) discussion ▪ Exposure monitoring ▪ Emergency response actions ▪ Hospital route directions • Necessary permits for well installation and/or boring advancement. • A Sampling and Analysis Plan (SAP) in accordance with the scope of work.	**Implementing Party:** Qualified Environmental Consultant and D-B Contractor **Reporting Party:** Qualified Environmental Consultant **Monitoring Party:** JPB	**X**				**Implementation:** Qualified Environmental Consultant will conduct a Phase II ESA for portions of the Project located within areas with a high likelihood of contamination prior to ground disturbance. **Reporting:** Prior to ground disturbance.	Phase II Environmental Site Assessment. Health and Safety Plan. Sampling and Analysis Plan. Risk Assessment (if necessary).

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
• Completion of a Risk Assessment if deemed necessary. • Laboratory analyses conducted by a State-certified laboratory. • Disposal process including transport by a State-certified hazardous material hauler to a State-certified disposal or recycling facility licensed to accept and treat hazardous waste.							
HAZ-2b: Implement engineering controls and best management practices during construction. During construction the contractor will employ use of engineering controls and BMPs to minimize human exposure to potential contaminants. Engineering controls and construction BMPs will include but not be limited to the following. ▪ Contractor employees working on site will be certified in OSHA's 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training. ▪ Contractor will monitor area around construction site for fugitive vapor emissions with appropriate field screening instrumentation. ▪ Contractor will water/mist soil as its being excavated and loaded onto transportation trucks. ▪ Contractor will place any stockpiled soil in areas shielded from prevailing winds. ▪ Contractor will cover the bottom of excavated areas with sheeting when work is not being performed.	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor **Reporting Party:** D-B Contractor and D-B-B Tunnel Contractor **Monitoring Party:** JPB	**X**	**X**			**Implementation:** The D-B Contractor and D-B-B Tunnel Contractor will employ engineering controls and BMPs to minimize human exposure to potential contaminants during construction. **Reporting:** Inclusions of controls in construction planning. Monthly during construction.	The D-B Contractor and D-B-B Tunnel Contractor will be contractually bound to comply with these requirements.
HYD-1: Implement construction dewatering treatment, if necessary. If groundwater is encountered during excavation and trenching activities, then dewatering may be required. If dewatering activities require discharges to the storm drain system or other water bodies, the water shall be treated as necessary prior to discharge so that all applicable water quality objectives are met. As a performance standard, water treatment methods shall be selected to achieve the maximum removal of contaminants found in the groundwater and that represent the Best Available Technology (BAT) that is economically achievable. Implemented measures may include the retention of dewatering effluent until particulate matter has settled before it is discharged, the use of infiltration areas, filtration, or other means. The contractor shall perform routine inspections of the construction area to verify that the water quality control measures are properly implemented and maintained, conduct visual observations of the water (i.e., check for odors, discoloration, or an oily sheen on groundwater) and any other sampling and reporting activities prior to discharge. The final selection of water quality control measures shall be submitted to the Regional Water Board for approval prior to construction. If the groundwater is found to not meet water quality standards and the identified water treatment measures cannot ensure treatment to meet all receiving water quality standards, the water shall then be hauled offsite instead for treatment and disposal at an appropriate waste treatment facility permitted to receive such water.	**Implementing Party:** D-B Contractor **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	**X**	**X**			**Implementation:** Requirements will be specified in design-build contracts, and will be implemented by the D-B Contractor for the duration of construction. **Reporting:** Monthly reporting for duration of construction.	The D-B Contractor will be contractually bound to comply with these requirements. Best Available Technology (BAT) for dewatering.
HYD-4: Minimize floodplain impacts by minimizing new impervious areas for TPFs or relocating these facilities. At PS3 (Option 1), PS6 (Option 1) and TPS2 (Option 3, at CEMOF), the design will minimize the amount of new impervious areas by using graveled or pervious pavement for all facility areas other than the foundations for new electric equipment and any other weight–bearing facilities. Currently unpaved areas not used to house new equipment shall remain unpaved or if paved shall	**Implementing Party:** D-B Contractor **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	**X**				**Implementation:** Requirements will be specified in design-build contracts, and will be implemented by the D-B Contractor in the final design. **Reporting:** Prior to final design.	Project design will minimize new impervious surface area.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
use pervious pavement. At other paralleling stations, TPS1, and the switching station, the same measure is recommended, but not required. The JPB could select PS3 Option 2 (to the northeast) which would remove this facility from the 100-year floodplain and PS6 could be placed at the Option 2, which is currently paved and then the requirements above would not apply. For TPS2, Caltrain could select one of the other options (Option 1 or Option 2), both of which are currently outside the 100-year floodplain.							
HYD-5: Provide for electrical safety at TPFs subject to periodic or potential flooding. For new TPFs within the current 100-year floodplain (PS3 Option 1, TPS-2 Option 3, and PS6 – both options), the preferred method of avoiding damage would be to place all new electrical equipment on elevated pads above expected flood depths and/or protect such equipment with flood barriers. If equipment cannot be designed so that flood waters cannot contact the equipment, then sealed or capped moisture-resistant components are required. Ground Fault Circuit Interrupters (GCFIs) shall be utilized for all electrical circuits below the base flood elevation for the 100-year flood. For all new traction power facilities subject to current flooding (for the current 100-year event), or with a potential for flooding due to levee or dam failure (PS3 [Option 1], PS5 [Option 2], PS6 [both options], TPS2 [all options] and possibly PS7 and PS7 Variant A and B, if selected), Caltrain shall develop emergency response procedures to provide electrical safety including system shutdown during projected flood events. Due to the potential for gaps in current FEMA mapping of areas subject to flooding due to levee failures, Caltrain shall also investigate potential flooding risks due to levee failures for all new TPFs and apply emergency shutdown requirements to all additional facilities identified as at risk of flooding due to potential levee failures.	**Implementing Party:** D-B Contractor **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	**X**			**X**	**Implementation:** Requirements will be specified in design-build contracts, and will be implemented by the D-B Contractor in the final design. JPB shall develop and adopt emergency response procedures. **Reporting:** Prior to final design and prior to and during operation.	Electrical equipment will be designed such that flood waters cannot contact or damage the equipment. Emergency response procedures will be adopted and implemented to manage flooding event risks.
HYD-7: Implement sea level rise vulnerability assessment and adaptation plan. The JPB will use State of California Sea Level Rise guidance (CO-CAT 2013), the California Adaptation strategy, as well as guidance from other agencies [i.e., BCDC]), for the development of the vulnerability assessment and adaptation plan. Under CEQA, this assessment and plan is only mandatory for the new facilities associated with the Proposed Project However, it is recommended that the JPB include analysis of all existing and new facilities subject to potential coastal flooding with predicted sea level rise. <u>Sea Level Rise Vulnerability Assessment</u> The analysis in the EIR considers potential vulnerability based on broad USGS mapping of potential inundation areas using specific SLR increments. This preliminary assessment shall be supplemented by a more detailed evaluation of future flood risks taking into account the following. • The range of SLR predictions based on current state guidance. • The specific elevations of Caltrain facilities. • Hydraulic connection of Caltrain facilities to San Francisco Bay and tidal channels. • Protectiveness of other structures (levees, seawalls, other development) between Caltrain facilities and San Francisco Bay and tidal channels. The vulnerability assessment shall describe the scenarios under which Caltrain facilities could become subject to flooding, the estimated duration of such flooding, and the potential damage that may result from such flooding scenarios. The JPB shall complete the vulnerability assessment within 5 years of project approval (nominally	**Implementing Party:** JPB in concert with other agencies (BART, VTA, etc.), jurisdictions (Millbrae, San Mateo, etc.), and landowners **Reporting Party** JPB **Monitoring Party:** JPB				**X**	**Implementation:** JPB will develop a SLR Vulnerability Assessment within 2 years of project approval. JPB will develop a SLR Adaptation Plan within 2 years of project approval and update every 5 years thereafter starting in 2021. **Reporting:** Following completion of SLR Vulnerability Assessment and SLR Adaptation Plan, and upon every update of each plan.	SLR Vulnerability Assessment. SLR Adaptation Plan.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
early 2020, assuming project approval in early 2015). The JPB shall share the results of its vulnerability assessment with other local agencies potentially affected by sea level rise along the Caltrain corridor. <u>Sea Level Rise Adaptation Plan</u> Based on the vulnerabilities identified, the JPB shall prepare an SLR Adaptation Plan identifying measures that will be taken to protect the new project facilities as well as the existing Caltrain facilities from potential damage due to future flooding from SLR. The JPB will coordinate with other entities with facilities close to the San Francisco Bay with an equal or greater SLR vulnerability, such as cities along the northern portion of the route (San Francisco, Brisbane, South San Francisco, San Bruno, Millbrae, Burlingame, San Mateo, Belmont, San Carlos and Redwood City), the San Francisco International Airport, the California Department of Transportation (U.S. Highway 101 and Interstate 380), the Bay Area Rapid Transit District, VTA, SFMTA, and other agencies. The requirements for development and implementation of this plan and updating over time are as follows. • 2016: The JPB shall complete the first SLR Adaptation Plan within 2 years of project approval (nominally end of 2016, assuming project approval in late 2014) including the following. o Review available scientific information on SLR data and projections for the subsequent 50 years. Where data and projections indicate different rates of SLR than previously applied, the JPB will adjust the vulnerability assessment and flood design criteria to reflect a median-point of then-current projections. o Review JPB system vulnerability for the subsequent 50 years in light of available data at that time and the adjusted flood design criteria. o Prepare a plan identifying improvements to meet the flood design criteria, as feasible and unconstrained by surrounding development not owned by JPB. The plan of improvements will be designed to meet the flood design criteria as predicted for the next 10 years and updated every 10 years thereafter. o The plan may include projects that the JPB implements on its own or in concert with other parties. The plan may also rely on flood improvements implemented separate from the JPB but that will also provide flooding benefits for Caltrain facilities provided such plans have a realistic funding and implementation schedule. o Where the JPB is a lead for improvements needed to address flooding risks expected within the next 10 years, the JPB shall complete all necessary environmental clearances and shall adopt such improvements as part of JPB's capital funding plans and identify funding sources for their implementation. o The goal for all improvements is to provide 100-year flood protection for Caltrain facilities from coastal flooding at all times, wherever feasible. Where that is not feasible, the JPB shall identify alternative means to provide for safe system operations in the event of flooding. o Identify opportunities for partnership with other local and regional parties for SLR adaptation or where regional efforts will address flooding risks to Caltrain facilities.								

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
• 2021 (and every 5 years thereafter): The JPB shall update the Adaptation Plan meeting the requirements described above. • Ongoing: Where JPB's adaptation options are constrained because of adjacent infrastructure (such as adjacent roadways and structures not owned by JPB), JPB will work with adjacent landowners and infrastructure managers to identify opportunities to improve rail system protection in concert with other local or regional parties.							
NOI-1a: Implement Construction Noise Control Plan. A noise control plan that incorporates, at a minimum, the following best practices into the construction scope of work and specifications to reduce the impact of temporary construction-related noise on nearby noise sensitive receptors shall be prepared and implemented. • An active community liaison program shall be established. The community liaison program will keep residents informed about construction plans so residents may plan around noise or vibration impacts and will provide a conduit for residents to express any concerns or complaints. Construction contact information shall be provided to local residents and posted on construction sites adjacent to residential areas. Residents within 300 feet of upcoming construction shall be notified 10-days in advance of the start of construction in an area wherever possible. • Contractor shall be required to use newer equipment fitted with the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment shall be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding). Electric or "quiet" equipment shall be used for generators, compressors, and other construction equipment where feasible. • Contractor shall employ construction methods or equipment that will provide the lowest level of noise and ground vibration impact near residences and consider alternative methods that are suitable for the soil condition. The contractor shall be required to select construction processes and techniques that create the lowest noise levels. • Truck loading, unloading, and hauling operations shall be conducted so that noise and vibration are kept to a minimum by carefully selecting routes to avoid going through residential neighborhoods to the greatest possible extent. Deliveries of materials and equipment shall be prioritized for daytime hours whenever feasible. • Ingress and egress to and from the staging area shall be on collector streets or higher street designations (preferred), and through routes for trucks will be designed to the extent feasible to minimize the frequency of backup alarm sound. • Idling equipment shall be turned off whenever feasible. • When practicable, temporary noise barriers will be used to protect sensitive receptors against excessive noise from construction activities. Partial enclosures around continuously operating equipment or temporary barriers along construction boundaries will be considered. • Construction activities within residential areas will be minimized during evening, nighttime, weekend, and holiday periods to the extent feasible. • Noise and vibration monitoring shall be conducted to verify compliance with the noise	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor **Reporting Party:** D-B Contractor and D-B-B Tunnel Contractor **Monitoring Party:** JPB	**X**	**X**			**Implementation:** The D-B Contractor and D-B-B Tunnel Contractor will develop a Construction Noise Control Plan prior to final design and implement during construction. **Reporting:** Prior to final design, weekly monitoring and reporting during construction.	The D-B Contractor and D-B-B Tunnel Contractor will be contractually bound to comply with these requirements. Construction Noise Control Plan.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
limits. Independent monitoring should be performed to check compliance in particularly sensitive areas. Contractor will be required to modify and/or reschedule their construction activities if monitoring determines that maximum limits are exceeded at residential land uses.							
NOI-1b: Conduct site-specific acoustical analysis of ancillary facilities based on the final mechanical equipment and site design and implement noise control treatments where required. A qualified acoustical consultant shall review final mechanical equipment and site design and calculate expected exterior noise levels at adjacent noise sensitive receptors to limit the substation noise at the TPS1, Option 3 site if selected for a substation site and at the PS5, Option 2 site if selected as a paralleling station site. If TPS1, Option 1 or TPS1, Option 2, or TPS1, Option 4 sites are selected instead, then this mitigation will not be required for TPS1, Option 3. If PS5, Option 1 or 1B were selected instead, then this mitigation will not be required for PS5, Option 2. A moderate noise impact has been identified at TPS1 Option 3 based on the FTA methodology and reference data. If the projected noise contribution from the substation is reduced by at least 2.8 dBA the impact will be eliminated. A performance criterion which limits the substation noise to a maximum noise level of 60 dBA at 50 feet, or no more than 63 dBA Ldn at the closest nearby noise sensitive receptor (111 Mitchel Avenue) would be sufficient to eliminate the moderate noise impact. A severe noise impact has been identified at PS5, Option 2 before mitigation and using FTA methodology and reference data. If the projected transformer noise level at the fenceline of the adjacent mixed use project could be reduced to 58 dBA (or 64.4 L_{dn}) the impact would be less than the FTA moderate impact level and the noise impact at this location would be less than significant. TPS1, Option 3, and PS5, Option 2 noise levels shall comply with IEEE national standards and guidelines for electrical power facilities. Station layouts and specific noise control measures will be developed during the design phase to minimize noise impacts resulting from the TPFs. Such noise control measures may include the following: • Locate electrical noise-generating equipment farther away from the property lines of noise sensitive sites, if at all possible. • Consider the use of special enclosures for all transformers to mitigate the associated low frequency noise impacts. • Reduce potential noise impacts from the ventilation system for switchgear by using acoustical louvers, line duct silencers, and hoods on the vent openings, and/or by locating vents at the side of the building that is not facing residences. • At PS5, Option 2, compliance with the performance criteria may require relocation of the facility southward to place the transformer at least 25 feet (for an oil-filled transformer type) to 55 feet (for a dry-type transformer) from the mixed use location. The areas to the south of the mixed use project are commercial buildings set back farther from the JPB ROW than the mixed use project and would be considered non-sensitive receptors. As shown in Figure 3.11-8, there are two potentially feasible locations south of PS5, Option 2 (referred to as PS5, Option 2B and PS5, Option 2C) that would be more than the required distances from the mixed use development and would avoid a significant noise impact.	**Implementing Party:** Qualified Acoustical Consultant and D-B Contractor **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	**X**				**Implementation:** Qualified Acoustical Consultant will work with the D-B Contractor to implement appropriate noise control treatments during final design. **Reporting:** Prior to final design, and following completion of construction.	The D-B Contractor will be contractually bound to comply with these requirements.
NOI-2a: Implement Construction Vibration Control Plan. A Construction Vibration Control Plan that includes, at a minimum, the following procedures to	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor	**X**	**X**			**Implementation:** The D-B Contractor and D-B-B Tunnel Contractor will develop a Construction	The D-B Contractor and D-B-B Tunnel Contractor will be contractually bound to

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing: Pre-Construction	Mitigation Timing: Construction	Mitigation Timing: Post-Construction	Mitigation Timing: Operation	Implementation and Reporting Schedule	Implementation Mechanism or Tool
minimize the potential for building damage from construction vibration shall be prepared: • Where feasible, avoid placing OCS poles within 25 feet of structures or use alternative construction methods for pile driving (such as augurs) to minimize potential vibration damage. • Where vibratory compacting/rolling is proposed within 15 feet of structures, utilize alternative equipment (such as non-vibratory rollers) to minimize potential vibration damage. • Where pile driving is proposed within 50 feet of structures or vibratory compacting/rolling within 25 feet, preconstruction surveys shall be conducted to document the existing condition of buildings in case damage is reported during or after construction. • Damaged buildings due to project construction shall be repaired or compensation paid. The Construction Vibration Control Plan shall also include, at a minimum, the following procedures to minimize the potential for annoyance from construction vibration: • When possible, limit the use of construction equipment that creates high vibration levels near residential structures. • Require vibration monitoring during vibration-intensive activities. • Where feasible, plan the hours of vibration-intensive equipment, such as vibratory pile drivers or vibratory rollers, so that impacts on residents are minimal (e.g., weekdays during daytime hours only, when as many residents as possible are away from home). The JPB and/or the Design-Build contractor will coordinate with Caltrans during development of the construction vibration plan concerning construction vibration that may occur near Caltrans facilities.	**Reporting Party:** D-B Contractor and D-B-B Tunnel Contractor **Monitoring Party:** JPB					Vibration Control Plan prior to final design and implement during construction. **Reporting:** Prior to final design, monthly during construction.	comply with these requirements. Construction Vibration Control Plan.
PSU-8a: Provide continuous coordination with all utility providers. The JPB will initiate coordination with all utility providers and local jurisdictions during engineering design and will continue coordination with these entities through final design and construction to ensure that all potential utility location conflicts are identified. To prevent damage to utility systems and minimize disruption or degradation of utility service to local customers, utilities will be avoided while constructing OCS pole foundations, TPFs, and overhead facilities where possible. Coordination efforts will focus on identifying potential conflicts, planning utility reroutes, and formulating and implementing strategies to address any problems that arise.	Implementing Party: D-B Contractor and JPB in coordination with utility providers **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	X	X			**Implementation:** D-B Contractor will coordinate with all utility providers and local jurisdictions to prevent damage to utility systems and minimize disruption or degradation of utility service to local customers. **Reporting:** Prior to final design and monthly during construction.	Potential conflicts will be identified through coordination with utility providers and local jurisdictions.
PSU-8b: Adjust OCS pole foundation locations. If underground utilities are discovered at proposed OCS pole foundation locations prior to construction, the JPB will assess the location of the underground utility and will adjust the location of the OCS pole foundations to avoid the utility wherever feasible. If the OCS pole foundation cannot be relocated to avoid the utility (which is unlikely), then the JPB will coordinate with the owner of the utility to identify feasible relocation options.	**Implementing Party**: D-B Contractor and JPB in coordination with utility providers **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	X				**Implementation:** D-B Contractor will develop plan for OCS pole locations that avoids utilities where feasible. **Reporting:** Prior to final design.	Final design will identify OCS pole locations.
PSU-8c: Schedule and notify users about potential service interruptions. The JPB will coordinate with all utility providers to schedule any short-term, limited service interruptions at least 30 days in advance and will notify all appropriate users accordingly.	**Implementing Party:** D- B Contractor and JPB in coordination with utility providers **Reporting Party:** D-B Contractor	X	X			**Implementation:** Users will be notified of service interruptions. **Reporting:** Users will be notified of service interruptions at least 30 days in advance.	Service interruption notices distributed by utility providers.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
	Monitoring Party: JPB						
PSU-9: Require application of relevant construction mitigation measures to utility relocation and transmission line construction by others. The JPB will require that all relevant construction mitigation measures identified in this EIR be applied to utility relocation and transmission line efforts. Within the Caltrain ROW or Caltrain-owned property, the JPB can mandate the implementation of such measures. Outside the Caltrain ROW, the JPB will recommend their use by utility owners and/or inclusion in any encroachment permits required by local jurisdictions.	**Implementing Party:** JPB and D-B Contractor **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	X	X			**Implementation:** Requirements will be specified in design-build contracts, and will be implemented by the D-B Contractor for the duration of construction. **Reporting:** Monthly throughout duration of construction.	The D-B Contractor will be contractually bound to comply with these requirements. JPB will work with utilities concerning their project.
TRA-1a: Implement Construction Road Traffic Control Plan. The JPB would coordinate with the traffic departments of local jurisdictions and with all corridor emergency service providers to develop a Traffic Control Plan consistent with the Caltrans *Manual on Uniform Traffic Control Devices* to mitigate construction impacts on transit service, roadway operations, emergency responses, pedestrian and bicycle facilities, and public safety. Measures that will be implemented throughout the course of project construction, will include, but not be limited to, the following: • Maintain acceptable response times and performance objectives for emergency response services. • Limit number of simultaneous street closures and consequent detours of transit and vehicular traffic within each immediate vicinity, with closure time frame limited as much as feasible for each closure, unless alternative traffic routings are available. • Implement traffic control measures to minimize traffic conflicts and delays to the traveling public for local roadways where lane closures and restricted travel speeds will be required for longer periods. • Provide advance notice of all construction-related street closures, durations, and detours to local jurisdictions, emergency service providers, and motorists. • Provide safety measures for vehicles, bicyclists and pedestrians to transit through construction zones safely. • Limit sidewalk, bicycle, and pedestrian walkway closures to one location within each vicinity at a time, with a closure time frame limited as much as feasible for each closure unless alternative routings for pedestrian and bicycle transit are available. • Provide designate areas for construction worker parking wherever feasible to minimize use of parking in residential or business areas. • Coordinate any construction effects to parking at the San Jose Diridon Station and at other areas used for SAP Center Parking with the City of San Jose and SAP Center representatives to minimize disruption of event parking. • If necessary, a Maintenance of Traffic Plan and/or a Traffic Management Plan would be established in accordance with Caltrans' *Manual on Uniform Traffic Control Devices.*	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor and JPB in coordination with local jurisdictions and emergency service providers **Reporting Party:** D-B Contractor and D-B-B Tunnel Contractor **Monitoring Party:** JPB	X	X			**Implementation:** D-B Contractor and D-B-B Tunnel Contractor will develop the Traffic Control Plan prior to construction; the D-B Contractor and D-B-B Tunnel Contractor will implement the Traffic Control Plan for the duration of construction. **Reporting:** Weekly monitoring, monthly reporting.	The D-B Contractor and D-B-B Tunnel Contractor will be contractually bound to comply with these requirements. Traffic Control Plan.
TRA-1c: Implement signal optimization and roadway geometry improvements at impacted intersections for the 2020 Project Condition. Table 3.14-17 summarizes the intersection impacts and the associated mitigation measures proposed to minimize localized traffic impacts. Detailed description for improvements at each impacted intersections are included in the transportation analysis report in Appendix D,	**Implementing Party:** JPB **Reporting Party:** JPB **Monitoring Party:** JPB	X	X			**Implementation:** JPB will be responsible for implementing signal optimization and roadway geometry improvements at identified intersections following construction. **Reporting:** Following completion of signal	Signal optimization and roadway changes.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
Transportation Analysis. Possible mitigation measures include signal optimization and roadway geometry improvements, as discussed below: • Signal optimization: Signal timing optimization would be performed to reduce delay at signalized intersections. This can include optimizing the cycle time, splits, and phasing. In addition, for closely spaced intersections, optimizing the offset and better signal coordination will also reduce delay. • Roadway geometry changes: Changing the roadway geometry could help reduce intersection delay. This would include changing the roadway width by widening the street or changing the existing geometry configuration through restriping. Intersection #64 (El Camino Real and Alma Street and Sand Hill Road) is an example of where roadway geometry could be altered as a mitigation measure to reduce intersection delay. • A review of the significantly affected intersections identified one location (7th/16th Street in San Francisco) where, with the proposed mitigation, there is a possibility of queues backing up to the grade crossing. Thus, this measure also includes pre-emption, pre-signals or queue cutters at this location to prevent an increase in potential queue back to the grade crossing. • JPB will coordinate with the CPUC during the final design phase of the project concerning adjustment of traffic signals and road geometry adjacent to at-grade crossings through the GO 88-B process. JPB will coordinate with local jurisdictions during the design phase of roadway mitigation measures that affect roadways under local jurisdiction.						optimization and/or roadway geometry improvements.	
TRA-2a: Implement construction railway disruption control plan. The JPB will make the efforts to contain disruption to Caltrain, tenant passenger, and freight services during construction. Measures that will be implemented throughout the course of project construction, will include, but are not limited to, the following: • The overall goal of this plan should be to minimize the overall duration of disruption of Caltrain, tenant passenger, and freight operations and maintain reasonable levels of service, while allowing for an expeditious completion of construction. • Limit number of simultaneous track closures within each immediate vicinity, with closure time frame limited as much as feasible for each closure, unless bypass tracks are available. • Provide safety measures for rail services to transit through construction zones safely. • Require contractors to coordinate with rail dispatch to minimize disruption of rail service in the corridor. • Where feasible, limit closure of any tracks for construction activities to off-peak periods and weekends, when service is less frequent or late night, when no passenger service is scheduled. • Where feasible, maintain acceptable service access for passenger and freight service. • Where one open track cannot be maintained for passenger or freight use, limit multi-track closures to one location at a time, as much as feasible • Where multi-track closures result in temporary elimination of transit rail service, work with local and regional transit providers to provide alternative transit service around	**Implementing Party:** D-B Contractor and D-B-B Tunnel Contractor and JPB in coordination with rail dispatch **Reporting Party:** D-B Contractor and D-B-B Tunnel Contractor **Monitoring Party:** JPB	**X**	**X**			**Implementation:** Requirements will be specified in contracts, and will be implemented by the D-B Contractor and D-B-B Tunnel Contractor for the duration of construction. **Reporting:** Weekly during construction.	The D-B Contractor and D-B-B Tunnel Contractor will be contractually bound to comply with these requirements. Construction railway disruption control plan prepared by D-B Contractor and D-B-B Tunnel Contractor.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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the closure area including increased bus and shuttle service. • Where multi-track closures result in temporary elimination of freight rail service, work with Union Pacific and freight users to schedule alternative freight service timing to minimize disruption to freight customers. • Provide advance notice of all construction-related track closures to all affected parties. Provide advance notice to transit riders of any temporary disruption in transit service. • Where temporary cessation of freight rail service is necessary due to multi-track closures and would result in substantial diversion to truck modes, Caltrain or its construction contractor shall coordinate with local jurisdictions and freight operations to determine preferred truck routes to minimize the effect on local traffic conditions. • Construction in and adjacent to BART facilities will be coordinated in advance and during construction with BART including any necessary BART safety monitors. If construction would result in any potential service disruption, Caltrain or its construction contractor shall coordinate with BART to avoid the disruption and/or minimize the extent and duration of disruption and provide information to commuters on alternative transit options during the disruption. • Caltrain and/or its construction contractor shall coordinate with Union Pacific in advance and during any potential disruption to freight operations and/or Union Pacific facilities. Union Pacific's emergency access will be maintained throughout construction.							
TRA-3b: In cooperation with the City and County of San Francisco, implement surface pedestrian facility improvements to address the Proposed Project's additional pedestrian movements at and immediately adjacent to the San Francisco 4th and King Station. The JPB, in cooperation with the City and County of San Francisco, will improve surface pedestrian facilities at the San Francisco 4th and King Station where needed to accommodate the Proposed Project's increase in pedestrian volumes. This mitigation applies to increased pedestrian traffic under Proposed Project conditions that would occur within the impact window beginning in 2020 and ending when DTX/TTC is fully operational. Both the JPB and the City and County of San Francisco will implement a pedestrian access study to identify the surface improvements necessary to accommodate the Proposed Project's increased pedestrian demand during the impact window identified above. The JPB's responsibility will be to implement mutually agreed upon improvements necessary to accommodate pedestrian demand within the Caltrain station and JPB-owned right-of-way. The City and County of San Francisco will be responsible for implementing improvements on City streets and the public right-of-way surrounding the 4th and King Station. Because there are multiple contributors to pedestrians to the station, including Caltrain, MUNI Metro J and T Lines, MUNI bus lines, the future Central Subway, and other transit line and local land use development, cost shall be shared on a fair-share basis as determined mutually by the JPB and the City and County of San Francisco. The performance standard guiding specific measures selection is as follows: • Pedestrian delay and illegal crossing activity shall be equivalent to or better than No Project conditions, and peak hour pedestrian sidewalk densities on primary access routes to the Fourth and King Station shall be less than or equal to projected No Project densities. The following surface improvements to pedestrian facilities will address increased pedestrian demand caused by the Proposed Project. These improvements will be studied in detail in the	**Implementing Party**: JPB in coordination with City and County of San Francisco **Reporting Party:** JPB **Monitoring Party:** JPB	**X**	**X**	**X**		**Implementation:** JPB will conduct surface pedestrian facility improvements. **Reporting:** JPB and the City and County of San Francisco will conduct a pedestrian access study during the PCEP design process. Reporting of pedestrian facility conditions will occur periodically throughout duration of project operations.	San Francisco 4th and King Station Pedestrian Access Study.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
pedestrian access study. • Widened curb waiting areas and added pedestrian bulbouts where high levels of demand cannot be accommodated by existing facilities. • A pedestrian "scramble" at the intersection of 4th and Townsend Streets. A pedestrian scramble is an intersection that is striped and designed to allow pedestrians to cross diagonally in all directions during an all-way red signal at which all motor vehicles are stopped. • Signalization improvements for both 4th and Townsend and 4th and King intersections. While a pedestrian scramble is not likely to be feasible at the intersection of 4th Street and King Street due intersection size, traffic volumes, and SMFTA at-grade transit operations, all-way pedestrian signals at existing crosswalks are potentially feasible. • Widened crosswalks to increase pedestrian volumes and improve pedestrian sidewalk widths on the immediate approaches to the intersections of 4th and Townsend and 4th and King Streets, as appropriate and feasible. • Pedestrian safety countermeasures, such as pedestrian barriers and improved signage, as necessary to address safety issues that are directly related to increased pedestrian volumes at station access points. The improvements identified in the access study shall be completed in a manner that does not interfere with SMTA bus operations, SFMTA Metro or bicycle facilities in and around the station area. The JPB will also coordinate with the CPUC during the final design phase of the Project concerning signal adjustments at 4th Street / King Street to ensure light rail vehicle operational safety through this intersection. This measure does not include any above- or below-ground pedestrian facilities, because the Proposed Project's impact can be address through feasible surface treatments described above.							
TRA-4b: Continue to improve bicycle facilities at Caltrain stations and partner with bike share programs where available following guidance in Caltrain's Bicycle Access and Parking Plan. Caltrain will improve bicycle facilities at Caltrain stations where needed to accommodate increased demand over time for such facilities including bike parking and bike lockers necessary to safely and securely park bikes that are not taken on the train. Caltrain will work local and regional bike share programs to provide opportunities for Caltrain riders to utilize bike share facilities located at Caltrain stations (where feasible) or nearby (where not).	**Implementing Party:** JPB **Reporting Party:** JPB **Monitoring Party:** JPB				X	**Implementation:** Following completion of construction, JPB will work with local and regional bike share programs to improve bicycle facilities at Caltrain stations. **Reporting:** Bike facility and safety will be monitored and reported periodically following completion of construction.	Bicycle Access and Parking Plan. Bikeshare programs in partnership with local and regional providers.
NOI-CUMUL-1: Implement a phased program to reduce cumulative train noise along the Caltrain corridor as necessary to address future cumulative noise increases over FTA thresholds The JPB, in cooperation with other rail operators, local jurisdictions, transportation funding agencies, and state and federal agencies, will support incremental noise reduction measures at the locations of cumulative noise impacts over time as funding becomes available for the locations where the PCEP would contribute to cumulative noise impacts. Where the PCEP does not contribute to cumulative noise impacts or where it would lower existing noise levels, then the PCEP is not responsible to participate in mitigation, even if the cumulative noise impacts due to other rail service increase is significant. Caltrain will work with local, state, and federal partners to establish priorities for noise reduction measure to be implemented as funding becomes available.	**Implementing Party:** JPB in cooperation with other rail operators, local jurisdictions, transportation funding agencies, and state and federal agencies **Reporting Party:** JPB **Monitoring Party:** JPB				X	**Implementation:** Implementing parties will prioritize, develop and implement phased programs to reduce cumulative noise impacts prior to future major increases in rail operations (such as HSR, Capitol Corridor, ACE and freight expansion). **Reporting:** Following implementation of phased programs.	Technical studies evaluating the need for and effectiveness of phased programs to reduce cumulative noise impacts.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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Caltrain will also work with other rail operators to seek funding participation from multiple parties on a fair-share basis in proportion to their cumulative noise contributions. The costs for implementing the phased program shall be borne by all rail operators in proportion to their contributions to cumulative train noise increases over existing conditions. Given that there are multiple contributors to cumulative rail noise, the JPB is only responsible to fund its fair share for necessary noise mitigation with other rail services responsible to fund their fair share as well. Fair share shall be determined by the noise contribution of each rail service increase over existing conditions (2013) to cumulative noise levels as determined using acceptable FTA noise modeling protocols. As noted above, the Proposed Project would result in increased noise at four of the 49 study locations in the 2020 cumulative scenario (but only three locations would have cumulatively significant noise increases in 2020), but if Caltrain implements full electrification (e.g. 100 percent EMU service from San Jose to San Francisco), then the combined effect of the Proposed Project and full electrification would not result in noise increases at any of the 49 study locations and no fair-share contribution would be necessary from Caltrain. This program is expected to be implemented over a period of decades. Improvements will be phased as needed to address changes in cumulative rail service over time and cumulative rail noise. ● The first cumulative milestone is 2020. The PCEP would contribute to significant cumulative impacts at three locations with PCEP contributions ranging from 8 to 13 percent: San Mateo near the 9th Avenue grade crossing (Receptor #19); Redwood City near the Whipple Avenue grade crossing (Receptor #25); and Palo Alto near the W. Charleston Road grade crossing (Receptor #36). At these locations, the cumulative noise increases identified in the EIR are the combination of the PCEP, assumed freight increases, and potential Coast Daylight service. Caltrain will monitor freight levels as well Coast Daylight planning in the time leading up to 2020. Caltrain will work with UPRR and Amtrak, as necessary, to coordinate fair-share contributions to cumulative mitigation and plan for implementation of feasible improvements by 2020 or by such period that cumulative noise at the three locations above is expected to exceed the FTA moderate threshold criteria. Since the PCEP increases are only a small portion of the cumulative impact in 2020, the fair-share contributions of other parties will need to be secured to implement potential mitigation. If the other parties are not willing to contribute their fair-share, then mitigation may not be feasible. ● The second cumulative milestone is 2026 or after when HSR blended service first commences along the Caltrain corridor. If Caltrain replaces all remnant diesel equipment by that time, then the PCEP would make no contribution to cumulative noise increases and would have no further mitigation responsibilities (operating up to 79 mph). If Caltrain is still operating a similar amount of diesel locomotives in 2026 or after as in 2020, then it would contribute approximately 3 percent to the increases at these four locations: Burlingame near the Broadway grade crossing (Receptor #14): San Mateo near the 9th Avenue grade crossing (Receptor #19); Redwood City near the Whipple Ave. grade crossing (Receptor #25); and Palo Alto near the W. Charleston Road grade crossing (Receptor #36). These four locations would all be affected by the PCEP, HSR, freight, and the Coast Daylight and the Palo Alto location could also be affected by Dumbarton Rail Corridor service. The subsequent project-level analysis of blended HSR service may refine the noise increases due to HSR and blended service when project level design details are taken into account. Caltrain's fair share responsibility for blended service with Caltrain EMUs operating up to 110 mph may exceed the PCEP's noise							

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
contribution since the PCEP is limited to 79 mph. Projected freight and other passenger rail increases may or may not occur. Caltrain will monitor freight levels changes and will work with CHSRA, UPRR, and Amtrak (and DRC sponsors if DRC is advanced) as necessary, to coordinate fair-share contributions to cumulative mitigation and plan for implementation of feasible improvements by 2026 or by such period that cumulative noise at the four locations above will exceed the FTA moderate threshold criteria. Since the PCEP increases are only a small portion of the cumulative impact, the fair-share contributions of other parties will need to be secured to implement potential mitigation. If the other parties are not willing or able to contribute their fair-share, then mitigation may not be feasible, although it is assumed that CHSRA will be able to secure sufficient funding to support mitigation to address HSR noise fair-share impacts. **Residential building sound insulation** The JPB, in cooperation with the other parties noted above, shall evaluate the potential to reduce cumulative noise impacts through the installation of building sound insulation improvements at residences projected to have a sound increase greater than the FTA moderate impact criteria. Building sound insulation methods may include extra wall insulation, window glazing and sealing of exterior surfaces. If this option is selected, a technical study shall be completed to evaluate the effectiveness of reducing cumulative impacts to less than the FTA moderate impact threshold through these methods. If the study shows that it is feasible to reduce the impact to less than the threshold at a cumulatively affected sensitive noise receptor, then no additional mitigation at that location will be required. Building sound insulation measures shall only be installed to the extent necessary to meet the impact threshold at the receptor location and shall only be installed if building owners are willing to accept such measures. **Quiet Zones** The lead agency for a quiet zone designation is the local jurisdiction (typically the City or County) that is responsible for traffic control and law enforcement on the roads at the at-grade crossings. The JPB, in cooperation with the other parties noted above, and the affected local jurisdictions shall implement a phased program considering the potential establishment of quiet zones along the Caltrain corridor at all locations where cumulative train noise is predicted to exceed FTA moderate impact thresholds. The JPB and other cooperating railroad operators will work closely with local jurisdictions to prepare the engineering studies and coordination agreements to design, construct, and enforce potential quiet zones. Options for establishing quiet zones could include implementation of the following FRA pre-approved supplemental safety measures (SSM): ● Four-quadrant gate system. This measure involves the installation of at least one gate for each direction of traffic to fully block vehicles from entering the crossing. ● Gates with medians or channelization devices. This measure keeps traffic in the proper travel lanes as it approaches the crossing, thus denying the driver the option of circumventing the gates by travelling in the opposite lane. ● One-way street with gates. This measure consists of one-way streets with gates installed so that all approaching travel lanes are completely blocked. This option may not be feasible or acceptable to local jurisdictions at all locations. ● Road closure. This measure consists of closing the road to through travel at the at-grade crossing. This option may not be feasible or acceptable to local jurisdictions at all							

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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locations. In addition to these pre-approved SSMs, the FRA also identifies a range of other measures that may be used to establish a quiet zone. These could be modified SSMs or non-engineering measures which might involve law enforcement or public awareness programs. Such alternative safety measures must be approved by the FRA based on the prerequisite that they provide an equivalent level of safety as the sounding of horns. Wayside horns can also be utilized as part of a quiet zone. While not avoiding the sounding of a horn, wayside horns affect a smaller area than train-mounted horn. Wayside horns can be used when the other measures above are not adequate to avoid the use of a horn. The lead agency for a quiet zone designation is the local public authority which is the only authority that can implement a quiet zone. Caltrain or the other rail operators cannot on their own designate the quiet zone. However, only with the implementation of the quiet zone can Caltrain, other tenant railroads and freight operators be relieved of the requirement to sound their horns when crossing at-grade crossings. One key aspect of local jurisdiction acceptance of a quiet zone is acceptance of potential liability in the event of accidents related to not sounding a horn at an at-grade crossing after the installation of any required SSMs. Thus, if a local city does not accept the quiet zone, then even if the required SSMs are present, Caltrain, freight and other rail operators would continue to use train horns as a safety device in compliance with FRA requirements. **Grade Separations** Caltrain, in cooperation with other rail operators, local jurisdictions, transportation funding agencies, and state and federal agencies, will support incremental grade separations at locations of cumulative noise impacts over time as funding becomes available. Caltrain will work with local, state, and federal partners to establish priorities for grade separations to be implemented as funding becomes available. Caltrain will also work with other rail providers to seek funding participation from multiple parties on a fair-share basis in proportion to noise contributions. **Costs** The specific costs are not known for this mitigation. As noted in the EIR, grade separations can cost $50 million to $100 million or more per location (42 locations could cost $2.1 to 4.2 billion) and quiet zone treatments can cost $1 million to $2 million per location (42 locations could cost $42 to $84 million). Building insulation costs have not been estimated.							
NOI-CUMUL-2: Conduct project-level vibration analysis for Blended System operations and implement vibration reduction measures as necessary and appropriate for the Caltrain corridor As noted above, the vibration analysis in this document uses worst-case assumptions. A project-level vibration analysis will be completed by CHSRA for both the San Jose to Merced segment and the Blended Service segment north of San Jose. If subsequent environmental evaluation by CHSRA shows that significant cumulative increases in vibration would not occur along the Caltrain ROW when considering the specific track improvements and HSR and Caltrain EMU design, then this mitigation would not be required or may only be required in certain locations. A significant cumulative impact would only occur when the number of vibration events approaches a doubling of existing conditions. These measures are only necessary to be in place by the time Blended Service operates on the Caltrain corridor north of Santa Clara or when HSR operates on dedicated track south of Santa Clara (to 2 miles south of Tamien Station). Based on the 2014 Business Plan, the earliest date for HSR blended service operations on the	**Implementing Party:** CHSRA and JPB in coordination with other rail operators **Reporting Party:** CHSRA/JPB **Monitoring Party:** JPB				X	**Implementation:** Implementing parties will conduct project-level vibration analysis for the San Jose to Merced segment of the California High-Speed Train System and the Blended Service segment north of San Jose and implement vibration reduction measures as necessary. **Reporting:** Following completion of project-level vibration analysis by CHSRA.	Project-level vibration analysis conducted by CHSRA.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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Caltrain corridor north of Santa Clara and south of Santa Clara on dedicated track would be 2026. Caltrain will coordinate with CHSRA during the subsequent environmental process for blended service to examine the actual potential for significant cumulative vibration impacts to actually occur and the need for mitigation. If the subsequent environmental evaluation shows significant cumulative vibration impacts taking into account the specific blended service track improvements, the JPB, in cooperation with CHSRA and other rail operators will support incremental train vibration reduction measures along the Caltrain ROW. Caltrain will work with CHSRA and other rail operators to establish priorities for vibration reduction measure to be implemented as funding becomes available. The timing for any necessary improvements should be combined with blended service track improvements and should occur prior to a doubling of vibration events. Based on the 2014 Business Plan, HSR operations would commence in 2026 which would double the vibration events and thus mitigation should be in place at that time. Potential vibration reduction measures could include, but are not limited to, special track support systems, vehicle suspension (HSR vehicles only), building modifications, trenches (if feasible), and buffer zones. The costs for implementing the phased program should be borne by all rail operators in proportion to their contributions to increased vibration events and/or levels. Given that there are multiple contributors to cumulative rail vibration events, the JPB is only responsible to fund its fair share for necessary vibration reduction measures with other rail services responsible to fund their fair share as well. However, if there is no governmental approval that triggers an obligation to share such costs, it may be impossible to require other railroads to pay their fair-share. Fair-share shall be determined by the vibration train event increases over existing conditions (2013).							
TRA-CUMUL-1: Implement a phased program to provide traffic improvements to reduce traffic delays near at-grade crossings and Caltrain stations The proposed signalization and minor roadway mitigations in Table 4-18 will be fully funded by Caltrain as they are directly related to the Proposed Project impact compared to 2040 No Project conditions. The performance standard for the project impacts compared to the No Project conditions are the significance criteria used in this EIR. Other long-term mitigation, such as grade separations, cannot be committed to by Caltrain at this time due to funding limitations, but Caltrain will work with local jurisdictions and funding partners to support such improvements as funding becomes available. JPB will coordinate with local jurisdictions during the design phase of roadway mitigation measures that affect roadways under local jurisdiction. Caltrain, in cooperation with local agencies and other parties, will support a phased program seeking to improve local roadway conditions along the Caltrain corridor near at-grade crossings and Caltrain stations where cumulative impacts have been identified and where the Proposed Project makes an adverse contribution to traffic delays. Separate from the specific Table 4-18 mitigation, given that there are multiple contributors to cumulative traffic conditions, Caltrain is only responsible to fund its fair share for other necessary improvements with local jurisdictions, future land use development as well as other rail services responsible to fund their fair share as well. Fair share shall be determined by cumulative contributions to future traffic levels or delays at identified significant cumulatively affected intersections and roadways determined using traffic modelling. In the long run, where adequate funding is available, there are a variety of technically feasible The following traffic improvements that would help to reduce cumulative traffic delays at	**Implementing Party:** JPB in cooperation with local agencies and other parties **Reporting Party:** JPB **Monitoring Party:** JPB				**X**	**Implementation:** Implementing parties will evaluate phased programs to improve local roadway conditions along the project corridor as necessary to anticipate cumulative traffic increases. **Reporting:** Minimum evaluation of need for mitigation every five years starting in 2020.	Traffic Improvement Program.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
intersections near at-grade crossings and Caltrain stations including, but not limited to the following options: ● Traffic signal optimization: Signal timing optimization can include optimizing the cycle time, splits, and phasing. In addition, for closely spaced intersections, optimizing the offset and better signal coordination can also reduce delay. Signal optimization is proposed as a mitigation measure at a number of study intersections as shown in Table 4-18. Caltrain will fund and implement the signalization in Table 4-18 as these impacts are directly related to Proposed Project impacts as they are identified relative to 2040 No Project conditions. ● Roadway Geometry Changes: Changing the roadway geometry can also help reduce intersection delay. This can include changing the roadway width by widening the street or changing the existing geometry configuration through restriping. Intersection #43 (Main Street and Middlefield Road) and Intersection #64 (El Camino Real and Alma Street and Sand Hill Road) are examples of where roadway geometry could be altered as a mitigation measure to reduce intersection delay. Roadway changes are proposed in Table 4-18. Caltrain will fund and implement the roadway improvements in Table 4-18 as these impacts are directly related to Proposed Project impacts as they are identified relative to 2040 No Project conditions. ● Grade Separations: Given the costs and disruption of major roadway widenings and grade separations[2], Caltrain cannot commit at this time to a comprehensive program of improvements that would address all cumulative impacts in the future, because it does not have the identified funding and does not expect to receive sufficient funding in the foreseeable future. However, Caltrain, in cooperation with local jurisdictions, transportation funding agencies, and state and federal agencies, will support incremental grade separations at locations of cumulative traffic impacts over time as funding becomes available. Caltrain will work with local, state, and federal partners to establish priorities for roadway improvements grade separations to be implemented as funding becomes available. Caltrain will also work with other rail parties to seek funding participation from multiple parties on a fair-share basis in proportion to traffic contributions or project contributions to traffic delays. ● Road Closures: One option for managing local traffic is to close roadways at grade crossings and reroute traffic via alternative roadways. This option may not be feasible or acceptable to local jurisdictions at many, if not all locations. This mitigation is funding limited as it relates to major road widenings and grade separations and will likely take many decades to implement. As noted above, the JPB is committed to implementing the improvements shown in Table 4-18 in a phased program as needed to address the Proposed Project's effects on local traffic.							
TRA-CUMUL-2: Implement technical solution to allow electric trolley bus transit across 16th Street without OCS conflicts in cooperation with SFMTA. The JPB, in cooperation with SFMTA, will implement a technical solution to allow operation of the ETB at the 16th street crossing as well as the Caltrain electrification.	**Implementing Party:** JPB/D-B Contractor in coordination with SFMTA **Reporting Party:** D-B Contractor **Monitoring Party:** JPB	**X**				**Implementation:** JPB/D-B Contractor and SFMTA will implement a technical solution to allow operation of the ETB at the 16th Street crossing as well as the Caltrain electrification prior to the final design.	Technical solution to OCS conflicts prepared by JPB/D-B Contractor in cooperation with SFMTA.

[2] While grade separations are a technically feasible way to reduce cumulative traffic impacts at the at-grade locations, it is a highly expensive mitigation strategy. As discussed above, Caltrain supports future efforts at grade separation where acceptable to local communities and where local, state, and federal funding can be obtained to fund these improvements. However, using an average assumed cost of $50 to $100 million per crossing (grade separations can cost much more sometimes), grade separating all existing 42 at-grade crossings would cost $2.1 to $4.2 billion. Grade separating only 17 locations that are nearest the 17 significant unavoidably impacted intersections noted above could cost $850 million to $1.7 billion. The budget for the Proposed Project is $1.225 billion by comparison. Thus, Caltrain cannot commit to a comprehensive program of grade separations at this time.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
Two feasible options for the SFMTA at-grade trolley crossing at 16th Street underneath the I-280 viaduct have been identified, both of which would involve a short phase break of the Caltrain OCS. Both options would include a short gap in the Caltrain OCS to allow the ETB OCS to be installed through the intersection. The short section of the ETB OCS would not be energized to avoid any potential for contact between energized parts of the Caltrain OCS and the ETB OCS. The options for equipment to facilitate Caltrain operations through the Caltrain OCS gap are as follows: • Option #1: Installation of a track-mounted transponder that automatically communicates with special on-board equipment to open the main circuit breaker and preclude current from reaching the car. o As a Caltrain consist approaches the 16th street crossing, the engineer would reduce the power draw and the track-mounted transponder would instruct the individual car to open its main breaker. Power drawn from pantographs outside the "zero-power zone" will allow the train to move through the crossing without slowing down. After clearing the crossing, the main breaker will close, and the power draw can be ramped up again. o Electric Trolley Buses will operate normally at the crossing, as the collector poles glide along the contact wires up to6" above the 25kV Caltrain OCS wires. Buses will encounter a roughly 6-foot-long (the width of the Caltrain pantograph) non-energized portion of contact wire at the crossing of each track, but can coast through that gap on a continuous wire structure. This type of movement is a part of normal operations in San Francisco. o This type of OCS wire structure has been used previously in Seattle and in Europe. • Option #2: Installation of a vacuum circuit breaker (VCB), which removes the requirement for special on-board equipment. o The VCB solution has only been available for about 15 years and has not been implemented on a large scale yet. This solution has been utilized in newer installations in China. Caltrain will need to obtain regulatory clearance from the CPUC for either of these solutions. The CPUC has not yet released regulations for 25kV traction power systems. The rulemaking process is ongoing. Caltrain, in cooperation with SFMTA will work with the CPUC to obtain approval of a technical solution for the 16th Street crossing. The placement of the ETB overhead wires needs to be identified by SFMTA in coordination with Caltrain as the ETB needs to cross in the lane with the overhead wires in order to avoid any power interruption for the bus while crossing the rail line. The following issues will be resolved during design of the improvement: wire height for the 22-Fillmore OCS, reliability of the Caltrain on-board (transponders), or off-board equipment, (vacuum circuit breakers), and emergency operating procedures in case of failure. In addition, Caltrain will work with SFMTA to identify any design, maintenance, or emergency contingency considerations important to the design of the crossing system to minimize additional maintenance effort or materials for SFMTA during operations and to identify emergency response actions in the event of any wire entanglement at the crossing.						**Reporting:** Prior to final design.	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
Mitigation Measure TRA-CUMUL-3: As warranted, Caltrain and freight operators will partner to provide Plate H clearance at the Lafayette Pedestrian Overpass location. Caltrain and freight operators share responsibility for the potential constraints that may occur due to the combination of a change in freight operating equipment and the installation of the OCS. If freight operators identify a plan to operate freight railcars along the Caltrain corridor between MP 52.0 and the Butterhouse Spur (MP 41.4) that would be hindered by the OCS installation compared with existing conditions, then Caltrain and freight operators shall implement site improvements to restore effective vertical height clearances where needed along the Caltrain corridor. Based on current analysis, the only proposed improvement in addition to the Proposed Project tunnel notching/track lowering at the four San Francisco tunnels and the track lowering at Hedding Avenue (MP 46.15), San Carlos Avenue (MP 47.89), Curtner Avenue (MP 50.59), a private overpass (MP 51.08), would be track lowering at the Lafayette Pedestrian Overpass (MP 43.65). Track lowering is a possible solution to rectify the reduction in clearance at constrained bridge overcrossings, but further study will be required to determine the condition of track subgrade in each specific area and to locate existing utilities that may impact the track lowering. If it is determined existing utilities are in the way of potential track lowering, the existing utilities will have to be relocated in order to achieve the desired clearance. Caltrain and the freight operators shall apportion any cost pursuant to the existing agreement between the parties. Presuming that any identified improvements will be implemented by an entity that is subject to CEQA, those improvements would need to be analyzed for their environmental impacts, as warranted, to determine if any additional significant impacts beyond those disclosed in this EIR for clearance improvements (e.g., those described in Chapter 2, *Project Description*). Environmental clearance shall be obtained, if necessary and required, prior to construction of any additional site improvements. All relevant mitigation included in this EIR would apply to any additional construction necessary to implement this mitigation measure.	**Implementing Party:** JPB and freight operators **Reporting Party:** JPB **Monitoring Party:** JPB				**X**	**Implementation**: Timing/need for action to be determined in consultation between UPRR and JPB. Freight operations to identify their future freight needs. JPB and UPRR to study needs for improvement and resolve cost sharing. Improvements to be completed within 3 years of mutual agreement on improvements and cost arrangements. **Reporting:** As needed.	Periodic consultation between UPRR and JPB per the Trackage Rights Agreement.

REFERENCED TABLES

Table 3.3-3. Special-Status Plants Known to Occur or that May Occur in the Project Corridor

Species	Status[a] Federal/State/ CRPR	California Distribution	Habitats	Blooming Period	Potential Occurrence in Project Corridor[b]
Acanthomintha duttonii San Mateo thornmint	E/E/1B.1	Central Coast, San Francisco Bay Area: two occurrences in San Mateo County.	Annual grassland and open areas in chaparral and coastal scrub, on serpentine vertisol clay soil, below 900 feet above mean sea level (MSL).	Apr–Jun	None—there is no suitable habitat present within project corridor.
Allium peninsulare var. *franciscanum* Franciscan onion	–/–/1B.2	Central Coast, San Francisco Bay region: Santa Clara, San Mateo, and Sonoma Counties.	Clay and often serpentine soils in cismontane woodland, valley and foothill grassland, below 1,000 feet above MSL.	May–Jun	Low—nine CNDDB occurrences within 5 miles of project corridor; low-quality suitable habitat present within project corridor.
Amsinckia lunaris Bent-flowered fiddleneck	–/–/1B.2	Inner North Coast Ranges, San Francisco Bay Area, west-southern Sacramento Valley, and west-northern San Joaquin Valley.	Coastal bluff scrub, valley and foothill grasslands, cismontane woodlands, 101,645 feet above MSL.	Mar–Jun	Low—three CNDDB occurrences within 5 miles of project corridor; low-quality suitable habitat present within project corridor.
Arctostaphylos franciscana Franciscan manzanita	P/–/1B.1	Historical occurrence in San Francisco; believed extinct in the wild.	Coastal scrub on serpentine soils, below 990 feet above MSL.	Feb–Apr	None—no suitable habitat within the project corridor.
Arctostaphylos imbricata San Bruno Mountain manzanita	–/E/1B.1	Western San Francisco Bay: San Bruno Mountain, San Mateo County.	Chaparral and coastal scrub on rocky outcrops.	Feb–May	None—no suitable habitat within the project corridor.
Arctostaphylos montana ssp. *ravenii* Presidio manzanita	E/E/1B.1	Presidio of San Francisco.	Chaparral, coastal prairie, coastal scrub, serpentine soils.	Feb–Mar	None—no suitable habitat within the project corridor.
Arctostaphylos montaraensis Montara manzanita	–/–/1B.2	Endemic to San Mateo County, San Bruno Mountain, Montara Mountains.	Maritime chaparral, coastal scrub, 650–1,640 feet above MSL.	Jan–Mar	None—no suitable habitat within the project corridor.
Arctostaphylos regismontana Kings Mountain manzanita	–/–/1B.2	Western San Francisco Bay region, northern Santa Cruz Mountains: Santa Cruz and San Mateo Counties.	Broadleaved upland forest, chaparral, North Coast coniferous forest, on granitic or sandstone soils.	Jan–Apr	None—no suitable habitat within the project corridor.
Arenaria paludicola Marsh sandwort	E/E/1B.1	Known only from three occurrence near Black Lake on Nipomo Mesa, San Luis Obispo County. Historically more wide ranging through Central and South Coast.	Boggy meadows, freshwater marshes, and swamps, below 1,000 feet above MSL.	May–Aug	None—no suitable habitat within the project corridor.
Astragalus tener var. *tener* Alkali milk-vetch	–/–/1B.2	Southern Sacramento Valley, northern San Joaquin Valley, east San Francisco Bay Area.	Playas, on adobe clay in valley and foothill grassland, vernal pools on alkaline soils, annual grassland on alkaline soil, seasonal wetlands; below 197 feet above MSL.	Mar–Jun	None—no suitable habitat within the project corridor.
Balsamorhiza macrolepis Big-scale balsamroot	–/–/1B.2	Scattered occurrences in the Coast Ranges and Sierra Nevada foothills.	Rocky annual grassland and fields, foothill woodland hillsides, sometimes serpentinite soils, below 4,600 feet above MSL.	Mar–Jun	None—no suitable habitat within the project corridor.
California macrophylla Round-leaved filaree	–/–/1B.1	Scattered occurrences in the Sacramento and San Joaquin Valleys, southern North Coast Ranges, San Francisco Bay Area, South Coast Ranges, Channel Islands, Transverse Ranges, and Peninsular Ranges.	Grasslands, on friable clay soils.	Mar–May	Low—one CNDDB occurrence within 5 miles of project corridor; low-quality suitable habitat present within project corridor.
Carex comosa Bristly sedge	–/–/2.1	Scattered occurrences throughout California, Oregon, and Washington.	Wet places and lake margins.	May–Sep	Low—one CNDDB occurrence within 5 miles of project corridor; low-quality suitable habitat present within project corridor.

Species	Status[a] Federal/State/ CRPR	California Distribution	Habitats	Blooming Period	Potential Occurrence in Project Corridor[b]
Centromadia parryi ssp. *congdonii* Congdon's tarplant	–/–/1B.1	Eastern San Francisco Bay Area, Salinas Valley, and Los Osos Valley.	Alkaline soils in annual grassland, on lower slopes, flats, and swales, sometimes on saline soils, below 755 feet above MSL.	May–Oct (Nov)	Low—five CNDDB occurrences within 5 miles of project corridor; low-quality suitable habitat present within project corridor.
Centromadia parryi ssp. *parryi* Pappose tarplant	–/–/1B.2	Butte, Colusa, Glenn, Lake, Napa, San Luis Obispo, San Mateo, Solano, and Sonoma Counties.	Often alkaline soils, chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic).	May–Nov	None—no suitable habitat within the project corridor.
Chloropyron maritimum ssp. *palustre* (*Cordylanthus maritimus* ssp. *palustris*) Point Reyes bird's-beak	–/–/1B.2	Coastal northern California from Humboldt to Santa Clara County.	Coastal salt marsh; below 33 feet above MSL.	Jun–Oct	None—no suitable habitat within the project corridor.
Chorizanthe robusta var. *robusta* Robust spineflower	E/–/1B.1	Coastal central California from San Mateo to Monterey County.	Coastal bluff scrub, coastal dunes openings in cismontane woodland, on sandy soil.	May–Sep	None—no suitable habitat within the project corridor.
Cirsium andrewsii Franciscan thistle	–/–/1B.2	Coastal California from Sonoma County to San Mateo County.	Moist areas in coastal prairie, coastal scrub, and mixed evergreen forest, sometimes on serpentine soils, 0–440 feet above MSL.	Mar–Jul	None—no suitable habitat within the project corridor.
Cirsium fontinale var. *campylon* Mt. Hamilton fountain thistle	–/–/1B.2	Mt. Hamilton Range, eastern San Francisco Bay Area: Alameda, Santa Clara, and Stanislaus Counties.	Freshwater seeps and streams on serpentine outcrops, chaparral, cismontaine woodland, valley and foothill grassland, 1,000–2,500 feet above MSL.	Apr–Oct	None—no suitable habitat within the project corridor.
Cirsium fontinale var. *fontinale* Fountain thistle	E/E/1B.1	Endemic to San Mateo County.	Seeps in chaparral and grassland, on serpentine soils.	Jun–Oct	None—no suitable habitat within the project corridor.
Cirsium occidentale var. *compactum* Compact cobwebby thistle	–/–/1B.2	San Francisco and San Luis Obispo Counties.	Chaparral, coastal dunes, coastal prairie, coastal scrub.	Apr–Jun	None—no suitable habitat within the project corridor.
Clarkia franciscana Presidio clarkia	E/E/1B.1	San Francisco Bay, Presidio, Oakland hills: Alameda and San Francisco Counties.	Serpentine grassland, coastal scrub.	May–Jul	None—no suitable habitat within the project corridor.
Collinsia corymbosa Round-headed Chinese-houses	–/–/1B.2	North Coast and northern Central Coast from Del Norte County to Marin County.	Coastal dunes, below 65 feet above MSL.	Apr–Jun	None—no suitable habitat within the project corridor.
Collinsia multicolor San Francisco collinsia	–/–/1B.2	Coastal California from San Francisco to Monterey County.	Closed-cone coniferous forest, coastal scrub.	Mar–May	None—no suitable habitat within the project corridor.
Dirca occidentalis Western leatherwood	–/–/1B.2	San Francisco Bay region: Alameda, Contra Costa, Marin, Santa Clara, San Mateo, and Sonoma Counties.	Moist areas in broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, riparian woodland, 82–1394 feet above MSL.	Jan–Apr	None—no suitable habitat within the project corridor.
Dudleya abramsii ssp. *setchellii* Santa Clara Valley dudleya	E/–/1B.1	Endemic to Santa Clara County.	Cismontane woodland, valley and foothill grassland, on rocky serpentine sites.	May–Jun	Low—nine CNDDB occurrences within 5 miles of project corridor; low-quality suitable habitat present within project corridor.
Eriophyllum latilobum San Mateo woolly sunflower	E/E/1B.1	One known occurrence in San Mateo County.	Open areas in coast live oak woodland, often on roadsides, sometimes on serpentine soils, 150–500 feet above MSL.	May–Jun	None—no suitable habitat within the project corridor

Species	Status[a] Federal/State/ CRPR	California Distribution	Habitats	Blooming Period	Potential Occurrence in Project Corridor[b]
Eryngium aristulatum var. *hooveri* Hoover's button-celery	–/–/1B.1	South San Francisco Bay Area, South Coast Ranges in Alameda, San Benito, Santa Clara, and San Luis Obispo Counties.	Vernal pool, 10–148 feet above MSL.	July	None—no suitable habitat within the project corridor.
Fritillaria biflora var. *ineziana* Hillsborough chocolate lily	–/–/1B.1	Endemic to Hillsborough area in San Mateo County.	Serpentine grassland.	Mar–Apr	None—no suitable habitat within the project corridor.
Fritillaria liliacea Fragrant fritillary	–/–/1B.2	Coast Ranges from Marin County to San Benito County.	Adobe soils of interior foothills, coastal prairie, coastal scrub, annual grassland, often on serpentine soils, below 1,350 feet.	Feb–Apr	None—no suitable habitat within the project corridor
Gilia capitata ssp. *chamissonis* Blue coast gilia	–/–/1B.1	Marin, San Francisco, and Sonoma Counties.	Coastal dunes and coastal scrub.	Apr–Jul	None—no suitable habitat within the project corridor.
Gilia millefoliata Dark-eyed gilia	–/–/1B.2	Coastal California from Del Norte to San Francisco County.	Coastal dunes; 10–65 feet above MSL.	Apr–Jul	None—no suitable habitat within the project corridor.
Helianthella castanea Diablo helianthella	–/–/1B.2	San Francisco Bay Area: Alameda, Contra Costa, Marin[c], San Francisco[c], and San Mateo Counties.	At chaparral/oak woodland ecotone, often in partial shade, on rocky soils, 80–3,800 feet above MSL.	Apr–Jun	None—no suitable habitat within the project corridor.
Hemizonia congesta ssp. *congesta* White seaside tarplant	–/–/1B.2	Mendocino, Marin, San Francisco, San Mateo, and Sonoma Counties.	Valley and foothill grassland, sometimes roadsides.	Apr–Nov	Low—two CNDDB occurrences within 5 miles of project corridor; low-quality suitable habitat present within project corridor.
Hesperevax sparsiflora var. *brevifolia* Short-leaved evax	–/–/1B.2	Humboldt, Mendocino, Marin, Santa Cruz, San Francisco, and Sonoma Counties.	Coastal dunes, sandy soils in coastal bluff scrub, below 700 feet above MSL.	Apr–Jun	None—no suitable habitat within the project corridor.
Hesperolinon congestum Marin dwarf-flax (=western flax)	T/T/1B.1	Marin, San Francisco, and San Mateo Counties.	Chaparral, serpentine grassland.	Apr–Jul	None—no suitable habitat within the project corridor
Horkelia cuneata var. *sericea* Kellogg's horkelia	–/–/1B.1	Coastal California from Marin County to Santa Barbara County.	Openings in closed-cone coniferous forest, coastal scrub, maritime chaparral, on sandy or gravelly soils.	Apr–Sep	None—no suitable habitat within the project corridor.
Horkelia marinensis Point Reyes horkelia	–/–/1B.2	Scattered occurrences in North Coast and northern Central Coast: Mendocino, Marin, Santa Cruz, and San Mateo Counties.	Coastal dunes, coastal scrub, perennial grassland on sandy soils, 15–1,150 feet above MSL.	May–Sep	None—no suitable habitat within the project corridor.
Lasthenia conjugens Contra Costa goldfields	E/–/1B.1	Scattered occurrences in Coast Range valleys and southwest edge of Sacramento Valley: Alameda, Contra Costa, Mendocino, Monterey, Napa, Santa Barbara[c], Santa Clara[c], and Solano Counties.	Alkaline or saline vernal pools and swales, below 700 feet above MSL.	Mar–Jun	None—no suitable habitat within the project corridor
Layia carnosa Beach layia	E/E/1B.1	Scattered occurrences along coastal California from Humboldt County to Santa Barbara County.	Coastal dunes, coastal scrub on sandy soil.	Mar–Jul	None—no suitable habitat within the project corridor.
Leptosiphon rosaceus Rose leptosiphon	–/–/1B.1	Marin, San Francisco[c], San Mateo, and Sonoma* Counties.	Coastal bluff scrub.	Apr–Jul	None—no suitable habitat within the project corridor.
Lessingia arachnoidea Crystal Springs lessingia	–/–/1B.2	San Mateo County, one location reported in Sonoma County.	Serpentine grassland and open grassy areas in serpentine chaparral, cismontane woodland.	Apr–Jul	None—no suitable habitat within the project corridor.

Species	Status[a] Federal/State/ CRPR	California Distribution	Habitats	Blooming Period	Potential Occurrence in Project Corridor[b]
Lessingia germanorum San Francisco lessingia	E/E/1B.1	San Francisco and San Mateo Counties.	Coastal scrub, on remnant dunes.	Jun–Nov	None—no suitable habitat within the project corridor.
Malacothamnus aboriginum Indian Valley bush mallow	–/–/1B.2	Inner South Coast Ranges: San Benito, Fresno, and Monterey Counties.	Rocky areas in chaparral and oak woodland, often in burned areas, 492–5,577 feet above MSL.	Apr–Oct	None—no suitable habitat within the project corridor.
Malacothamnus arcuatus Arcuate bush-mallow	–/–/1B.2	Santa Clara, Santa Cruz, and San Mateo Counties.	Chaparral, 49–1,165 feet above MSL.	Apr–Sep	None—no suitable habitat within the project corridor.
Malacothamnus davidsonii Davidson's bush-mallow	–/–/1B.2	Los Angeles, Monterey, and San Luis Obispo Counties.	Coastal scrub, chaparral, and riparian woodland in sandy washes, 900–2,800 feet above MSL.	Jun–Sep	None—no suitable habitat within the project corridor.
Malacothamnus hallii Hall's bush-mallow	–/–/1B.2	Alameda, Contra Costa, Merced, Santa Clara, and Stanislaus Counties.	Chaparral and coastal scrub, 30–2,500 feet above MSL.	May–Sep	None—no suitable habitat within the project corridor.
Microseris paludosa Marsh microseris	–/–/1B.2	Coastal California from Mendocino County to San Luis Obispo County.	Grassland, coastal scrub, closed-cone-coniferous forest, cismontane woodland.	Apr–Jul	Low—one CNDDB occurrence within 5 miles of project corridor; low-quality suitable habitat present within project corridor.
Monolopia gracilens Woodland woollythreads	–/–/1B.2	Contra Costa, Alameda (reported), Santa Clara, San Mateo, Santa Cruz, Monterey, San Luis Obispo Counties.	Cismontane woodland, openings in broadleaved forest, openings in north coast coniferous forest, openings in chaparral, and serpentine valley and foothill grassland, 328–3,937 feet above MSL.	Mar–Jun (Feb)	None—no suitable habitat within the project corridor.
Pentachaeta bellidiflora White-rayed pentachaeta	E/E/1B.1	One occurrence in San Mateo County, historically known also from Marin and Santa Cruz Counties.	Annual grassland, often on serpentine soils.	Mar–May	None—no suitable habitat within the project corridor
Plagiobothrys chorisianus var. *chorisianus* Choris' popcornflower	–/–/1B.2	Southwest San Francisco Bay Area, northern Central Coast: Santa Cruz, San Francisco and San Mateo Counties.	Chaparral, coastal prairie, coastal scrub, in mesic areas.	Mar–Jun	None—no suitable habitat within the project corridor.
Plagiobothrys diffusus San Francisco popcornflower	–/E/1B.1	Alameda and Santa Cruz County.	Coastal prairie, valley and foothill grassland.	Mar–Jun	None—not known to occur in the counties in which the project is located.
Polemonium carneum Oregon polemonium	–/–/2.2	Alameda, Del Norte, Humboldt, Marin, San Francisco, Siskiyou, San Mateo, and Sonoma Counties.	Coastal prairie, coastal scrub, and lower montane coniferous forest.	Apr–Sep	None—no suitable habitat within the project corridor.
Potentilla hickmanii Hickman's cinquefoil	E/E/1B.1	Monterey, San Mateo, and Sonoma[c] Counties.	Freshwater marshes, seeps, and small streams in open areas in coastal scrub or coniferous forest.	Apr–Aug	None—no suitable habitat within the project corridor.
Sanicula maritima Adobe sanicle	–/R/1B.1	Coastal Monterey and San Luis Obispo Counties. Historically known from the San Francisco Bay area: Alameda[c] and San Francisco[c] Counties.	Moist clay or ultramafic soils, in meadows and grassland.	Feb–May	None—no suitable habitat within the project corridor.
Silene verecunda ssp. *verecunda* San Francisco campion	–/–/1B.2	Northern Central Coast, San Francisco Bay Area: San Francisco, and San Mateo, Santa Cruz Counties; also Sutter County.	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland, in sandy areas, 100–2,100 feet above MSL.	Mar–Aug	Low—six CNDDB occurrences within 5 miles of the project and limited suitable habitat is present within the project corridor.
Streptanthus albidus ssp. *albidus* Metcalf Canyon jewel-flower	E/–/1B.1	Endemic to Santa Clara County.	Valley and foothill grassland, on serpentine soils.	Apr–Jul	None—no suitable habitat within the project corridor.

Species	Status[a] Federal/State/ CRPR	California Distribution	Habitats	Blooming Period	Potential Occurrence in Project Corridor[b]
Streptanthus albidus ssp. *peramoenus* Most beautiful jewel-flower	–/–/1B.2	Eastern San Francisco Bay area, Central south coastal outer ranges: Alameda, Contra Costa, Monterey, and Santa Clara Counties.	Chaparral, annual grassland, on ridges and slopes on serpentine outcrops, 450–3,200 feet above MSL.	Apr–Jun	None—no suitable habitat within the project corridor.
Stuckenia filiformis (*Potamogeton filiformis*) Slender-leaved pondweed	–/–/2.2	Scattered locations in Contra Costa, El Dorado, Lassen, Merced, Mono, Modoc, Mariposa, Placer, and Sierra Counties; presumed extirpated in Santa Clara County.	Freshwater marsh, shallow emergent wetlands and freshwater lakes, drainage channels; 984–7,054 feet above MSL.	May–July	None—no suitable habitat within the project corridor.
Sueda californica California seablite	E/–/1B.1	Morro Bay, San Luis Obispo County, historically found in south San Francisco Bay.	Margins of tidal salt marsh, below 49 feet above MSL.	Jul–Oct	None—no suitable habitat within the project corridor.
Trifolium amoenum Showy rancheria clover	E/–/1B.1	Coast Range foothills, San Francisco Bay region from Mendocino County to Santa Clara County.	Low elevation grasslands, including swales and disturbed areas, sometimes on serpentine soils.	Apr–Jun	Low—two CNDDB occurrences within 5 miles of project corridor; low-quality suitable habitat present within project corridor.
Trifolium hydrophilum Saline clover	–/–/1B.2	Sacramento Valley, central western California.	Salt marsh, mesic alkaline areas in grasslands, vernal pools.	Apr–Jun	None—no suitable habitat within the project corridor.
Triquetrella californica Coastal triquetrella	–/–/1B.2	Scattered localities in Coastal California: Contra Costa, Mendocino, San Diego, and San Francisco Counties.	On soil in coastal bluff scrub and coastal scrub, 33–328 feet above MSL.	N/A	None—no suitable habitat within the project corridor.

[a] Status explanations:

Federal

E = listed as endangered under the Endangered Species Act (ESA)

P = proposed for listing under the ESA

– = no listing

State

E = listed as endangered under the California Endangered Species Act

– = no listing

California Rare Plant Rank (CRPR)

1B = List 1B species: rare, threatened, or endangered in California and elsewhere

2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere

CRPR Code Extensions:

0.1 = seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat

0.2 = fairly endangered in California (20–80% of occurrences threatened)

[b] Definitions of levels of potential occurrence:

Moderate: Plant known to occur in the region from the CNDDB or other documents regarding the vicinity of the Proposed Project, or habitat conditions are of suitable quality.

Low: Plant not known to occur in the region from the CNDDB or other documents regarding the vicinity of the Proposed Project; or habitat conditions are of poor quality.

None: Plant not known to occur in the region from the CNDDB or other documents regarding the vicinity of the Proposed Project; or suitable habitat is not present in any condition.

[c] Species has not been observed here, but is expected to also occur at this location.

CNDDB = California Natural Diversity Database

Table 3.14-17. Summary of Intersection Impacts and Mitigation Measures

Int. ID	City	Intersection	Impacted Peak Hour	Mitigation Strategies	Impact Significance after Mitigation
		Signalized Intersections			
1	San Francisco	4th Street and King Street	PM	Revise signal timing and phasing to better coordinate with 4th Street and Townsend Street	Less than significant
2	San Francisco	4th Street and Townsend Street	PM	Revise signal timing and phasing to better coordinate with 4th Street and King Street	Less than significant
5	San Francisco	7th Street and 16th Street	AM	Widen northbound approach to lengthen left turn pocket Remove parking lane to create a third lane for the eastbound approach Revise signal timing and phasing to better coordinate with 16th Street and Owens Street Pre-emption, pre-signals or queue cutters as necessary to manage queues relative to the rail crossing.	Less than significant
16	San Francisco	El Camino Real and Millbrae Avenue	AM and PM	Adjust signal timings to better serve traffic after project implementation	Less than significant
17	Millbrae	Millbrae Avenue and Rollins Road	PM	Adjust signal timings to better serve traffic after project implementation	Less than significant
18	Burlingame	California Drive and Broadway	~~AM and~~ PM	Adjust signal timings to better serve traffic after project implementation	Less than significant
36	San Mateo	E Hillsdale Boulevard and El Camino Real	AM	Adjust signal timings to better serve traffic after project implementation	Less than significant
55	Menlo Park	El Camino Real and Glenwood Avenue	AM and PM	Adjust signal timings to better serve traffic after project implementation	Less than significant
56	Menlo Park	El Camino Real and Oak Grove Avenue	AM	Adjust signal timings to better serve traffic after project implementation	Less than significant
63	Palo Alto	Meadow Drive and Alma Street	AM and PM	No feasible mitigations exist[ba]	Significant and unavoidable
64	Palo Alto	El Camino Real and Alma Street and Sand Hill Road	AM	Widen west leg of Sand Hill Road by adding one lane to allow southbound right turns on red Adjust signal timings to better serve traffic after project implementation Evaluate potential signal pre-emption with Caltrans and City of Palo Alto to manage traffic movements.	Less than significant
66	Palo Alto	Alma Street and Churchill Avenue	AM and PM	No feasible mitigations exist[ba]	Significant and unavoidable
68	Palo Alto	Alma Street and Charleston Road	AM and PM	No feasible mitigations exist[ba]	Significant and unavoidable
70	Mt. View	Central Expressway and N Rengstorff Avenue	PM	No feasible mitigations exist[ba]	Significant and unavoidable
71	Mt. View	Central Expressway and Moffett Boulevard and Castro Street	AM and PM	No feasible mitigations exist[ba]	Significant and unavoidable
75	Sunnyvale	W Evelyn and S Mary Avenue	PM	No feasible mitigations exist[eb]	Significant and unavoidable
80	San Jose	W Santa Clara Street and Cahill Street	PM	Adjust signal timings to better serve traffic after project implementation	Less than significant
81	San Jose	South Montgomery Street and W San Fernando Street	PM	Adjust signal timings to better serve traffic after project implementation	Less than significant
		Stop-Controlled Intersections			
21	Burlingame	Carolan Avenue and Oak Grove Avenue	AM and PM	Signalize intersection	Significant and unavoidable[dc]
51	Atherton	El Camino Real and Watkins Avenue	AM and PM	Signalize intersection	Less than significant
54	Atherton	Glenwood Avenue and Middlefield Road	AM and PM	Signalize intersection	Less than significant

Source: Appendix D, *Transportation Analysis*

[a] Addition of through lanes along Central Expressway and Alma Street may reduce the impact at this location, but the addition of through lanes is subject to ROW constraints and is, therefore, infeasible.

[b] Implementation of a grade-separated crossing may reduce the impact but is subject to fiscal constraints. Therefore, this mitigation is considered infeasible for purposes of this document.

[c] Intersection impacts would be less than significant after mitigation, but a secondary impact would be produced at Intersection #20 (California Drive and Oak Grove Avenue) with the signalization of Carolan Avenue/Oak Grove Avenue. After mitigation, average vehicle delay would increase by more than 4 seconds at Intersection #20.

Table 4-18. Summary of 2040 Cumulative Intersection Impacts and Mitigation Measures

Int. ID	Intersection	Impacted Peak Hour(s)	Mitigation Strategies	Impact Significance after Mitigation
Signalized Intersections				
1	4th Street and King Street	AM	Adjust signal timings to better serve traffic after project implementation	Significant and unavoidable (SU)
5	7th Street and 16th Street	AM and PM	Widen northbound approach to lengthen left turn pocket Revise signal timing and phasing to better coordinate with 16th Street and Owens Street. Pre-emption, pre-signals or queue cutters to prevent an increase in potential queue back to the grade crossing.	Less-than-significant after mitigation (LTS)

Responses to Certain Comments on the Final EIR and Additional Errata to the Final EIR

Introduction

This document provides responses to certain issues raised in certain comments on the Final EIR and several additional errata revisions to the Final EIR. None of these errata result in the identification of any new significant impacts or any substantially more severe significant impacts and thus their addition to the EIR does not trigger any requirements for recirculation.

Additional Responses to Certain Issues Raised in Certain Comments on the Final EIR

While CEQA requires consideration of the substantive issues raised in any written comments submitted during the CEQA review process, CEQA only requires the preparation of written responses to substantive issues raised in written comment submitted during the specified review period for the Draft EIR which was from February 28, 2014 to April 29, 2014.

Despite being under no obligation to respond in writing, the JPB has opted to respond to certain specific issues raised in certain comments on the Final EIR: (1) Union Pacific (01/7/15); Roland Lebrun (01/06/15); and (3) from the Silicon Valley Law Group on behalf of San Jose Arena Management, LLC (01/7/15). These comments were included in the JPB Board Packet for 01/08/15 and are part of the administrative record.

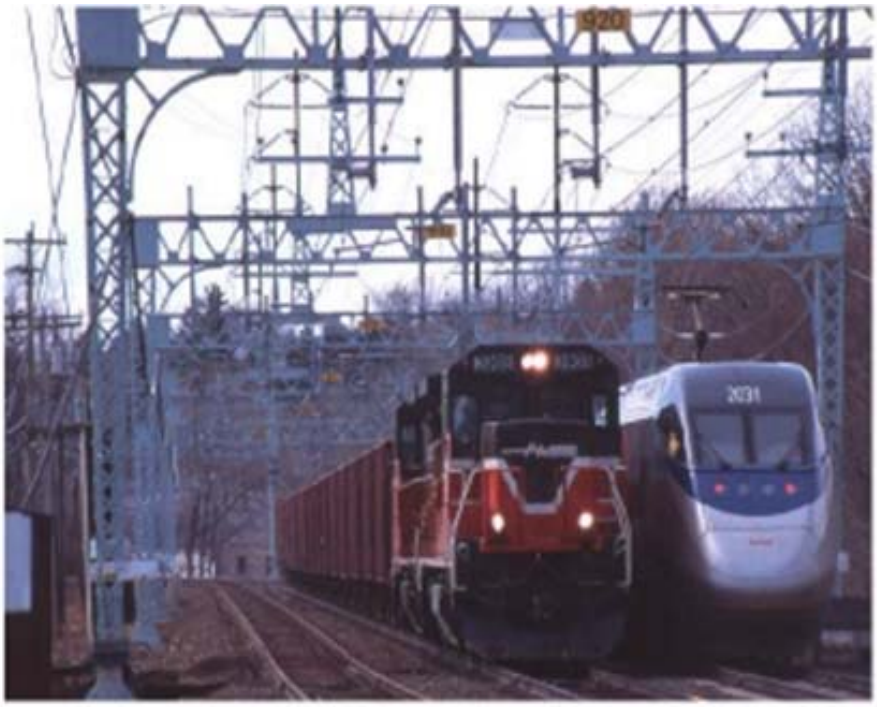
Response to certain issues raised in the January 7, 2015 comment submitted by Union Pacific

This comment raised certain issues concerning CPUC general orders and EMF/EMI concerns. The comments on CPUC matters are not CEQA concerns. While the EMF/EMI comments primarily raise issues adequately addressed previously in the FEIR, several additional responses are provided below:

- Shared Tracks and EMF/EMI: The comment asserts that the JPB has not identified any locations where EMI issues have been successfully handled for shared tracks between electrified trains with overhead OCS and freight. This is incorrect. Vol. II, Chapter 3, Master Response 11 (Freight), Page 3-55, Lines 24 to 32 describes "*Diesel locomotives run compatibly side-by-side and on shared tracks with electric trains on the NEC and its connected commuter railroads in areas of dense, critical rail service, at speeds up to 150 mph. The NEC electric trains have power systems that are similar to those planned for the PCEP. The NEC electric train traction voltage and electrical current levels are similar to those planned for PCEP. The NEC electrified and non-electrified tracks have similar signal systems to those broadly and routinely used on electric rail transit lines across the U.S. The electrified and non-electrified commuter railroads connected to the NEC have grade crossing systems that are similar to those used on sections of the Union Pacific lines and to those broadly and routinely used on light rail and commuter rail lines across the U.S.* " As further evidence, additional information has been added to Master Response 11 (freight describing that the there are many portions of the NEC where freight and electrified trains share

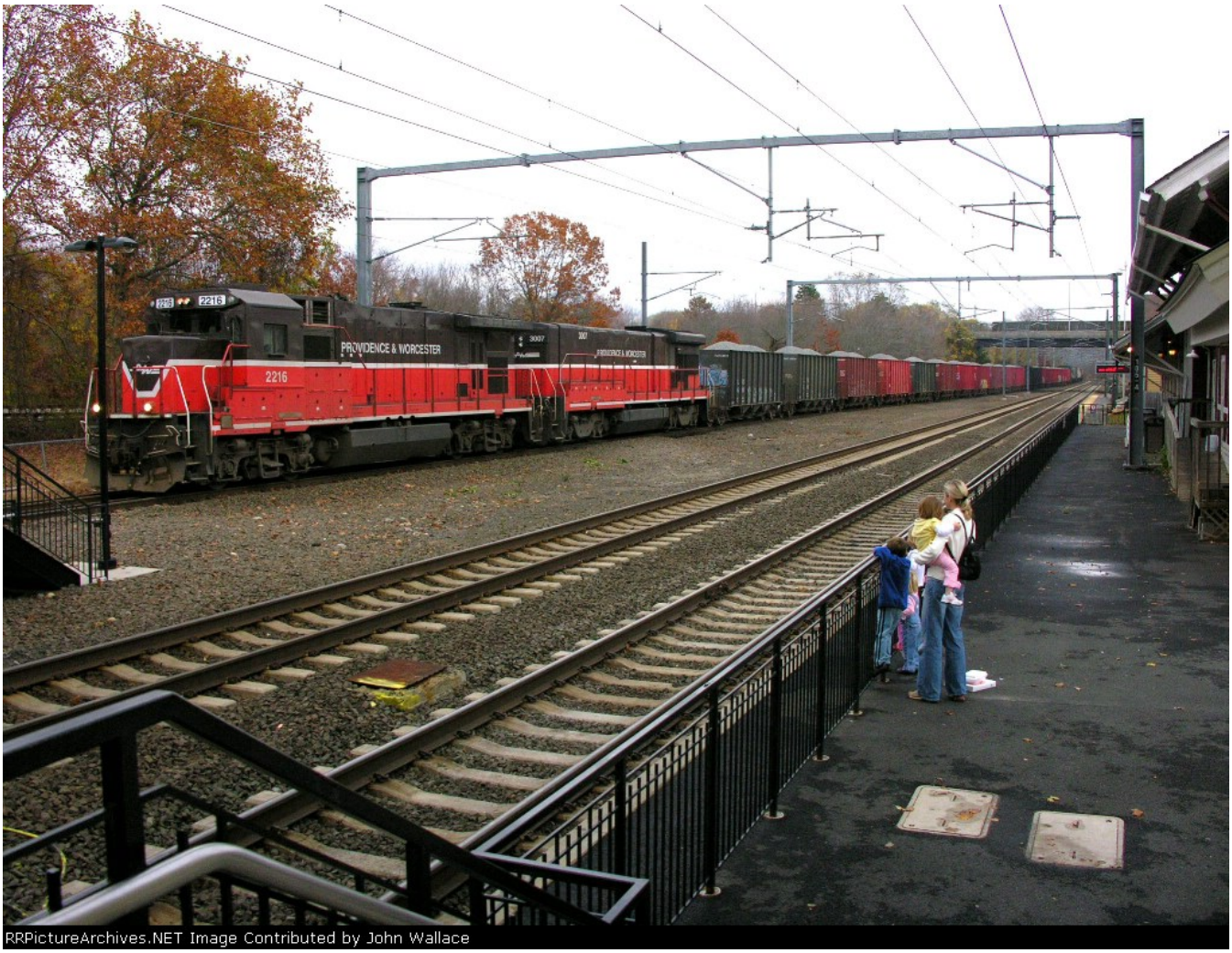
tracks such as the Providential-Worchester Line. According to the Northeast Corridor Master Infrastructure Plan[1], on a typical day, seven freight railroads operate up to 50 trains over Amtrak-owned portions of the NEC. The only portions of the entire NEC network without active freight service are between Queens, NY and Newark, NJ and between Landover, MD and Washington DC. The Acela operates between Washington, DC, New York, and Boston, which means that electrified passenger rail and freight are sharing the NEC for the vast majority of the electrified service area. Figures 1 and 2 below show shared right of way operations of the electrified Acela service with non-electrified Providence & Worcester freight rail and specifically show diesel freight trains operating "under the wires" of electrified OCS for electrified passenger trains. The FEIR has been revised to add this definitive evidence of shared electrified passenger rail and freight system operation on the NEC. Any signal systems in such segments are in shared use by both electrified passenger trains and non-electrified freight trains. The Acela and freight have been operating successfully and safely for many years on the NEC. There are also shared rail systems in Europe and Russia and in Chile where diesels are running "under the wire". Thus, contrary to the comment from Union Pacific, the condition of shared freight and passenger tracks is not unique and handling EMI effects for shared tracks is well understood. This is evidence that addressing EMI concerns on Caltrain corridor system is feasible based on real world examples and that Mitigation Measure EMF-2 can feasibly address potential signal concerns raised by Union Pacific. It should also be noted that since Caltrain and freight share tracks, the signal system used by freight is the same system used by passenger trains. Caltrain shares the same interest in the safe operations of train signal systems and advanced warning devices as Union Pacific and Mitigation Measure EMF-2 requires Caltrain to work with Union Pacific (and other parties) to ensure that signals and advanced warning devices operate correctly with the project. Thus, this comment does not raise any inadequacy in the EIR analysis of EMF/EMI issues and apart from adding the evidence of existing operating shared track systems, there is no further need for revision of the EIR in this regard to this comment.

[1] NEC Master Plan Working Group. 2010. Northeast Corridor Master Infrastructure Plan. Working Group includes representatives of 12 states, the District of Columbia, Amtrak, FRA, 8 commuter and 3 freight railroads operating on the NEC. May. Available: http://www.amtrak.com/ccurl/870/270/Northeast-Corridor-Infrastructure-Master-Plan.pdf.



Low speed freight trains and high-speed passenger trains operating at up to 150 mph share the NEC right-of-way as illustrated here by Amtrak *Acela Express* operating with Providence & Worcester.

Figure 1: Photograph of Shared Acela and Freight Operations on the Northeast Corridor (Source: NEC Master Plan Working Group. 2010)



- **Figure 2: Photograph of Providence and Worchester freight railroad operating on shared tracks with electrified 25 kV overhead contact system overhead on the Northeast Corridor.**

- Power System Impacts on Signal Systems: The comment asserts that there are (and have been in the past) several locations in North America where electrical power systems have caused EMI that has affected railroad signaling systems and other effects. Although the comment does not actually describe the location and circumstance of these alleged problem locations, taking Union Pacific at their word, the prior Master Response 11 (Freight), has been revised to delete reference to electrical transmission systems not resulting in any EMI impacts to railroads. This deleted text on electrical transmission systems is not material to the FEIR conclusions which concern EMI impacts from electrified rail OCS for the PCEP. The EIR identifies and acknowledges a potential project EMI impact to signal systems, describes the NEC example of successful shared electrified passenger and freight operations, and requires mitigation (Mitigation Measure EMF-2) which requires evaluation, testing, implementation and monitoring of EMI and/or replacement of signal systems and advanced warning devices in order to safely operate electrified passenger and freight rail service along the Caltrain Corridor.

- AFO-based circuits: The comment asserts that there would be safety impacts due to replacement of current warning devices at grade crossings with AFO-based circuits. As the comment describes, AFO-based circuits would trigger the advanced warning devices when a train crosses within a certain distance of the crossing. This would mean that the advanced warning time for a freight train will be more than for a passenger train operating at full speed. Freight trains on the corridor generally operate at slower speeds than passenger trains. The comment asserts that motorists might be tempted to drive around the gates because of a perception that the longer wait time is due to a false activation. The comment provides no evidence that this would actually occur and thus is speculative. The Caltrain corridor currently has and will have FRA-approved advanced warning systems, signals, and barriers at grade crossings. It is the responsibility and legal obligation of motorists to obey such systems, signals and barriers which are there for their safety. As such, while motorists may have to wait longer a few times per day on the peninsula (there are only 2 round-trip trains per day on any one segment between Santa Clara and San Francisco and freight operates outside of peak traffic times), which would be a minor inconvenience, there is no evidence provided in this comment that this would actually create a significant impact on safety. Thus, there is no need for further revisions to the FEIR concerning the comment on AFO-based circuits.

Response to one issue raised in the January 6, 2015 comment submitted by Roland Lebrun

This comment raised certain issues concerning consistency with Prop 1A, dual-mode multiple unit trains (aka "hybrid" trains as described in the comment), factory trains for construction, and the potential use of extended "neutral" or non-electrified sections as part of mitigation for cumulative impacts to freight heights. Issues concerning Prop 1A, dual-mode multiple unit alternatives and a factory train alternative are adequately addressed previously in the FEIR. Additional response is provided below to the comment about extended neutral sections:

- The comment claims that scoping comments on the Draft EIR described the use of neutral sections as mitigation for impacts to restricted overhead clearances at bridges and overpasses. This is incorrect. Mr. Lebrun's scoping letter comment suggests the use of neutral sections to address potential impacts to overhead utilities, not to restricted overhead clearances at bridges and overpasses. Overhead utilities can be relocated underground or above the OCS as described in the EIR without the use of neutral sections. The scoping comment from Mr. Lebrun does not mention the potential use of neutral sections to manage freight overhead clearance impacts and Mr. Lebrun's comment letter on the Draft EIR does not mention neutral sections at all.

- Network Rail (UK) has used neutral sections for the Paisley Canal project as a cost saving measure for areas of restricted overhead clearance and there are several other examples of neutral section gaps in the tens of meters length. However, Network Rail does not recommend use of extended neutral sections for its core network and only recommends their use "when there is a low risk that a train might come to a standstill and cause a problem to service performance, where line speeds are low, and service frequency is low."[2] This is not necessarily

[2] Network Rail. 2013. Network RUS: Alternative Solutions. July. Available: http://www.networkrail.co.uk/browse%20documents/rus%20documents/route%20utilisation%20strategies/network/working%20group%205%20-%20alternative%20solutions/network%20rus%20alternative%20solutions.pdf.

analogous to the Caltrain corridor where speeds are not low and service frequency is relatively high. The most constrained location for overhead clearance in the mid-Peninsula area is the San Francisquito Creek Bridge between the Palo Alto and Menlo Park stations. This low point defines the restriction on height from the Butterhouse Spur to Bayshore. The bridge is at a location where trains can and do operate at speeds up to 79 mph so the appropriateness of a neutral section solution at this location is unknown without further technical evaluation.

- Furthermore, Mr. Lebrun is raising this comment one day before the certification hearing whereas he had ample opportunity to raise this issue in comment on the Draft EIR or further in advance before the certification hearing and thus it is unreasonable to expect the JPB to complete a technical evaluation of an entirely new technical mitigation option at the 11th hour.

- Nevertheless, as there is evidence in the UK of the use of "neutral sections" under the right circumstances, which may or may not apply to the Caltrain Corridor given speed and frequency concerns noted above, Mitigation Measure TRA-CUMUL-3 has been revised to require the JPB to conduct a feasibility analysis of the potential use of a "neutral section" at the San Francisquito Bridge to potentially avoid/minimize restrictions to freight overhead clearance below Plate H between San Jose and Bayshore. [3] If the use of a "neutral section" is feasible at the San Francisquito Bridge without compromising project service improvement objectives or safety, then the mitigation will require that some combination of track lowering and "neutral sections" (if feasible) be used to provide Plate H clearance between San Jose and Bayshore.

Response to San Jose Arena Management, LLC January 6, 2015 comment submitted on Behalf of Sharks Sports & Entertainment

The comment submitted on behalf of SSE dated January 6, 2015 asserts that the parking analysis in the Final EIR underestimates existing parking capacity and future with project impacts on parking.

- Existing Demand: In a separate errata responding to a June 9, 2014 comment submitted concerning the SAP Center, responses have been provided that document how the existing parking capacity was estimated. Nothing in this comment warrants revision to the prior analysis

- Future with Project Impacts: In a separate errata responding to a June 9, 2014 comment submitted concerning the SAP Center, responses have been provided that document how future parking demands were estimated. Nothing in this comment warrants revision to the prior analysis.

- Parking "Mitigation" Responsibility Assignment: The comment asserts that the EIR assigns parking mitigation responsibility to the City of San Jose. The EIR does no such thing. The EIR does not identify a significant parking impact of the PCEP; therefore no mitigation is proposed. The FEIR describes the Diridon Station Area Plan and the approach the City of San Jose is using concerning parking. This is not "mitigation" for the PCEP's impact on parking. Furthermore, the comment letter asserts that the JPB should provide mitigation for the loss of parking at the Caltrain Diridon parking lot due to proposed development in the Diridon Station Area Plan. The PCEP does not include any development in the Caltrain Diridon parking lot, and thus no

[3] North of Bayshore, overhead clearance is restricted by tunnels which are too long for consideration of a "neutral section".

mitigation is warranted related to any such future development as part of the PCEP EIR. The City of San Jose is the lead agency for the DSAP and as such is responsible for any DSAP required actions or mitigations, as determined necessary in the CEQA process for the DSAP.

- As described in the PCEP EIR, a parking deficit in and of itself is not considered a significant impact on the environment. Furthermore, the EIR also presents evidence that a likely response to Caltrain parking deficits would be shifts in customer behavior, primarily through use of other means to access areas (carpools, transit, bike, walk, etc.) particularly given the planning for other modes of access to the Diridon Station in the future. Even if some Caltrain riders are deterred from using Caltrain due to a parking deficit, as described in the EIR, most of the projected ridership is still expected to occur. The PCEP EIR also describes the evidence for a shift in the mode of access to Diridon for future Caltrain users (see FEIR, Vol. III, Appendix D) compared to existing conditions. Modeling of the mode of access was conducted by an expert traffic engineering consulting firm, Fehr & Peers. While the comment letter may disagree with Fehr & Peers analysis of parking demand, there is evidence on the record supporting the conclusions presented in the EIR and no further revisions are necessary to the FEIR in response to this comment.
- The comment also includes a table that purports to show a "6pm" event parking demand for the SAP Center. The table is confusing and not directly applicable to Caltrain. It present numbers for transit demand at 6pm and states that there would be a deficit of 933 spaces if a new 900 space garage for SAP center is not build (which the DSAP calls for) and the Adobe lot is not available. However, even if the transit demand numbers are realistic (given the lateness of the comment there was insufficient time to conduct an independent analysis of the table), the table doesn't mention on-street parking, which would likely be more than enough to accommodate any shortfall that might occur on event days even if patrons might need to walk some distance to the SAP Center as a result. Off-site street parking for events is a common practice at many event centers.
- No further revisions to the EIR are necessary pursuant to this comment.

Errata Changes/Addition to the Final EIR

The following changes are made to the Final EIR document released on December 4, 2014. Changes to the December 4, 2014 FEIR text are noted in ~~strikeout~~ for deleted text and <u>underline</u> for added text:

Vol. 1, Executive Summary, Table ES-2, Page ES-47 is modified as follows:

TRA-CUMUL-3: As warranted, Caltrain and freight operators will partner to provide Plate H clearance ~~as the Lafayette Pedestrian Overpass location .~~ as <u>feasible between San Jose and Bayshore</u>

Vol. 1, Section 4.1, Cumulative Impacts, Page 4-151, following Line 223 to 44 to Page 4-153, Line 13 is modified as follows:

<u>An alternative approach to the San Francisquito Bridge vertical clearance would be to provide a short "neutral section" in which the OCS would have a non-electrified segment through the bridge. This approach has been used for several short areas of electrified railroads in the UK in areas of constrained overhead clearance, but has only been recommended for low speed, low frequency branch lines (Network Rail 2013, Network</u>

RUS Alternative Solutions). Mitigation Measure TRA-CUMUL-3 requires assessment of the feasibility of a neutral section for the San Francisquito Bridge location. If a neutral section is feasible while supporting project service objectives and safety, then Mitigation Measure TRA-CUMUL-3 would require the use of neutral section at the San Francisquito Bridge location as necessary to accommodate actual freight use of Plate H equipment north of Santa Clara (as noted previously, at present freight operators are not using Plate H equipment north of San Jose).

However, if a neutral section is not feasible at San Francisquito Bridge, ~~As a result,~~ freight heights from Bayshore (MP 5.5) to the Butterhouse Spur (MP 41.4) would be limited to 18.92' (Plate F+) which is the height of current equipment, but is less than the existing effective clearance on this segment of approximately 20.25' (Plate H). There are no freight spurs from the San Francisquito Bridge (MP 29.7) to the Butterhouse Spur (MP 41.4), so Mitigation Measure TRA-CUMUL-3 would only include~~s~~ improvements south of the Butterhouse Spur if a neutral section is not feasible at the San Francisquito Bridge.

Thus, with Mitigation Measure TRA-CUMUL-3, vertical clearances from the south end of the project (MP 52.0) to the Butterhouse Spur (MP 41.4) would allow Plate H equipment similar to today's existing effective conditions. If Plate H clearance cannot be provided at the San Francisquito Bridge through use of a neutral section, from the Butterhouse Spur to Bayshore, Plate F+ (18.92') equipment could be used the same as under today's operations, but Plate H equipment could not be used. North of Bayshore, the project's proposed tunnel improvements would provide the same effective vertical clearance as present, and no additional tunnel improvements are included as mitigation.

If Plate H clearance cannot be provided at the San Francisquito Creek Bridge through use of a neutral section, Mitigation Measure TRA-CUMUL-3 would be limited to track lowering at the Lafayette Pedestrian Overpass (MP 43.65) to provide Plate H clearance to allow Plate H clearance to be able to access the Butterhouse Spur.

The residual cumulative impact would be a future constraint on train equipment to existing freight heights from the Butterhouse Spur to Bayshore to Plate F+ (18.92') instead of the current possible Plate H (20.25') clearance. While it is not likely that freight will be diverted to truck modes due to this change, given that existing Plate H equipment is not used on this portion of the corridor, it is possible there might be a mode shift for some of the future freight growth. As discussed above, this would not be a significant regional traffic, air quality or GHG emissions cumulative impact, but might result in some localized noise or traffic impacts, depending on location of truck haul routes, timing, and intensity. This is considered a significant and unavoidable impact, primarily due to the concerns described above concerning the San Francisquito Bridge,

However, if Plate H clearance can be provided at the San Francisquito Bridge through use of a neutral section, then Mitigation Measure TRA-CUMUL-3 would require track lowering and/or neutral sections (if feasible) at additional locations to allow Plate H equipment operation from San Jose to Bayshore. In this scenario, Plate H clearance would be provided from San Jose to Bayshore, similar to that available today (but not utilized) and there would not be a potential for shift of freight from rail to truck modes and this impact would be mitigated to a less than significant level.

Mitigation Measure TRA-CUMUL-3: As warranted, Caltrain and freight operators will partner to provide ~~-~~Plate H clearance as feasible between San Jose and Bayshore ~~the Lafayette Pedestrian Overpass location~~

Caltrain and freight operators share responsibility for the potential constraints that may occur due to the combination of a change in freight operating equipment and the installation of the OCS.

Bayshore to Butterhouse Spur (MP 41.4)

If freight operators identify a plan to operate freight railcars along the Caltrain corridor between Bayshore and the Butterhouse Spur (MP 41.4) that would be hindered by the OCS installation compared with existing conditions, then Caltrain and freight operators shall evaluate the feasibility to provide Plate H effective vertical height clearances where needed along this segment of the Caltrain corridor.

The evaluation shall first include a feasibility assessment of a "neutral section", or unelectrified segment, for the San Francisquito Bridge. If the use of a "neutral section" is feasible without compromising project service improvement objectives or safety, then a combination of track lowering and "neutral sections" (if feasible) shall be used to provide Plate H clearance between Bayshore and the Butterhouse Spur (MP 41.4).

Based on current analysis (see Table 4-23) apart from San Francisquito Bridge, additional vertical clearance height would be required at the following locations to support Plate H equipment: Oyster Point Parkway (MP 8.60, +0.1'), Signal Bridge (MP 9.10, +0.7'), San Antonio Avenue (MP 34.0, +0.63'), Highway 85 (MP 36.5, +0.15'), Pedestrian Overpass (MP 39.40, +0.44') and Lawrence Expressway (MP 40.75, +.16').

If a "neutral section" is not feasible at the San Francisquito Bridge and thus the entire segment would be constrained by the low point at the San Francisquito Bridge, then no further improvements are required between Bayshore and the Butterhouse Spur.

Butterhouse Spur (MP 41.4) to MP 52.0

If freight operators identify a plan to operate freight railcars along the Caltrain corridor between MP 52.0 and the Butterhouse Spur (MP 41.4) that would be hindered by the OCS installation compared with existing conditions, then Caltrain and freight operators shall implement site improvements to restore effective vertical height clearances where needed along the Caltrain corridor.

Based on current analysis, the only proposed improvement in addition to the Proposed Project tunnel notching/track lowering at the four San Francisco tunnels and the track lowering at Hedding Avenue (MP 46.15), San Carlos Avenue (MP 47.89), Curtner Avenue (MP 50.59), a private overpass (MP 51.08), would be track lowering at the Lafayette Pedestrian Overpass (MP 43.65).

Both Segments

Track lowering is a possible solution to rectify the reduction in clearance at constrained bridge overcrossings, but further study will be required to determine the condition of track subgrade in each specific area and to locate existing utilities that may impact the track lowering. If it is

determined existing utilities are in the way of potential track lowering, the existing utilities will have to be relocated in order to achieve the desired clearance.

Caltrain and the freight operators shall apportion any cost pursuant to the existing agreement between the parties.

Presuming that any identified improvements will be implemented by an entity that is subject to CEQA, those improvements would need to be analyzed for their environmental impacts, as warranted, to determine if any additional significant impacts beyond those disclosed in this EIR for clearance improvements (e.g., those described in Chapter 2, *Project Description*). Environmental clearance shall be obtained, if necessary and required, prior to construction of any additional site improvements.

All relevant mitigation included in this EIR would apply to any additional construction necessary to implement this mitigation measure.

Vol. II, Chapter 3, Response to Comments, Master Response 11 (Freight), Page 3-54, Line 38 to Page 3-55, Line 10 is modified as follows:

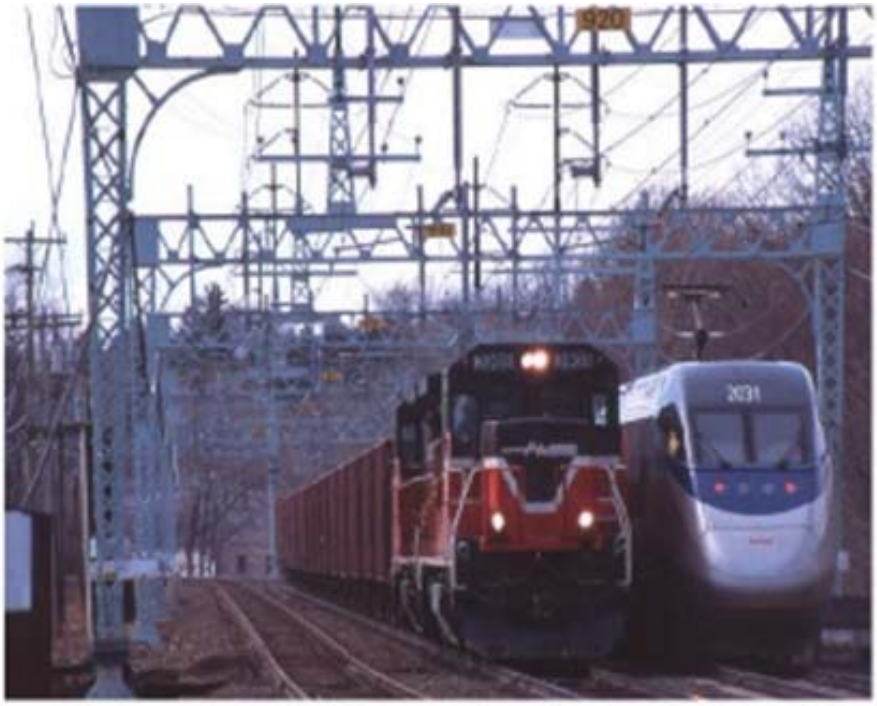
~~Commenters note that power systems naturally create EMFs, and that EMFs can cause electromagnetic interference ("EMI"). The U.S. utility electric system covers the country with hundreds of thousands of miles of high voltage (>60 kilovolt [kV]) transmission lines and millions of miles of distribution lines operating at voltages up to 25 kV, both three phase and single phase. Union Pacific operates its railroad every day in close proximity to these electric utility power systems and associated distribution and transmission lines. The power system EMFs do not cause EMI that interferes with either the safe or dependable operation of the railroad. This is because the practices and steps necessary to achieve and demonstrate electromagnetic compatibility ("EMC") between railways and electric utility power systems are conventional, fully understood, and routine, within the U.S. and around the world. The practices and steps necessary to achieve and demonstrate EMC between electrified and non-electrified railways are similar to those used for electric utility power systems, and are also conventional, fully understood, and routine.~~

Vol. II, Response to Comments, Master Response 11 (Freight), Page 3-55, the following text is added after Line 32:

There are many portions of the NEC where freight and electrified trains share tracks such as the Providence-Worchester Line. According to the Northeast Corridor Master Infrastructure Plan[4], on a typical day, seven freight railroads operate up to 50 trains over Amtrak-owned portions of the NEC. The only portions of the entire NEC network without active freight service are between Queens, NY and Newark, NJ and between Landover, MD and Washington DC. The Acela operates between Washington, DC, New York, and Boston, which means that electrified passenger rail and freight are sharing the NEC for the vast majority of the electrified service area. Figures A and B below show

[4] NEC Master Plan Working Group. 2010. Northeast Corridor Master Infrastructure Plan. Working Group includes representatives of 12 states, the District of Columbia, Amtrak, FRA, 8 commuter and 3 freight railroads operating on the NEC. May. Available: http://www.amtrak.com/ccurl/870/270/Northeast-Corridor-Infrastructure-Master-Plan.pdf.

shared right of way operations of the electrified Acela service with non-electrified Providence & Worcester freight rail and specifically show diesel freight trains operating "under the wires" of electrified OCS for electrified passenger trains. Any signal systems in such segments are in shared use by both electrified passenger trains and non-electrified freight trains. The Acela and freight have been operating successfully and safely for many years on the NEC. There are also shared rail systems in Europe and Russia and in Chile where diesels are running "under the wire".



Low speed freight trains and high-speed passenger trains operating at up to 150 mph share the NEC right-of-way as illustrated here by Amtrak *Acela Express* operating with Providence & Worcester.

Figure A: Photograph of Shared Acela and Freight Operations on the Northeast Corridor (Source: NEC Master Plan Working Group. 2010)

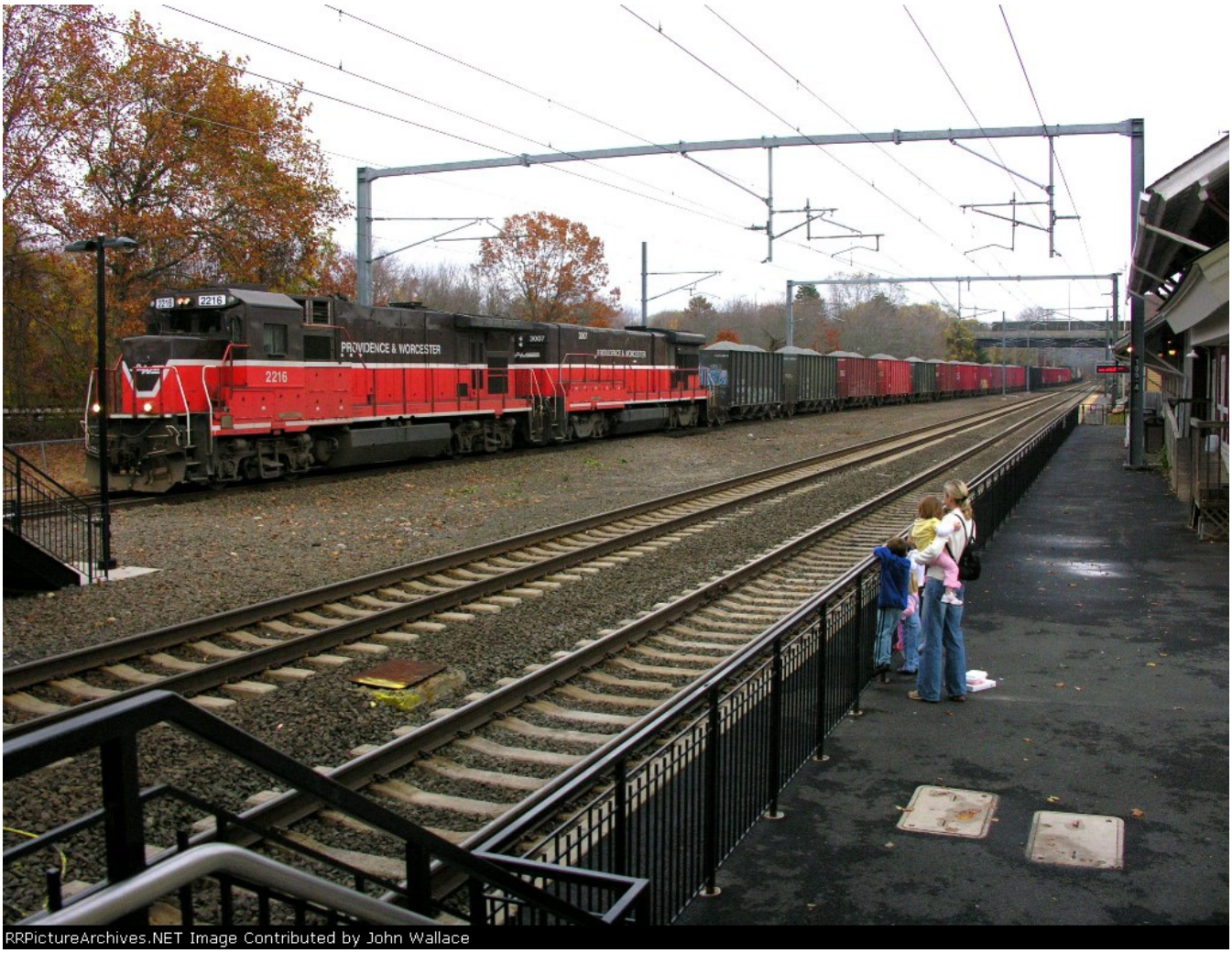


Figure B: Photograph of Providence and Worchester freight railroad operating on shared tracks with electrified 25 kV overhead contact system overhead on the Northeast Corridor

Revisions to the CEQA Findings

Introduction

This document provides revisions to the CEQA Findings regarding Impact CUMUL-14-TRA, Cumulative effects to transportation and traffic (localized traffic and freight service during operation) and Mitigation Measure TRA-CUMUL-3

For Freight Service Operation

Mitigation Measure TRA-CUMUL-3: As warranted, Caltrain and freight operators will partner to provide Plate H clearance as feasible between San Jose and Bayshore ~~the Lafayette Pedestrian Overpass location~~

If use of a "neutral section" at the San Francisquito Bridge is not feasible, then Mitigation Measure TRA-CUMUL-3 would be limited to track lowering at the Lafayette Pedestrian Overpass (MP 43.65) to allow Plate H clearance to be able to access the Butterhouse Spur. The residual cumulative impact would be a future constraint on train equipment to existing freight heights from the Butterhouse Spur to Bayshore to Plate F+ (18.92') instead of the current possible Plate H (20.25') clearance. While it is not likely that freight will be diverted to truck modes due to this change, given that existing Plate H equipment is not used on this portion of the corridor, it is possible there might be a mode shift for some of the future freight growth. As discussed in Section 4, Other CEQA – Required Analysis of the FEIR, this would not be a significant regional traffic, air quality or GHG emissions cumulative impact, but might result in some localized noise or traffic impacts, depending on location of truck haul routes, timing, and intensity. This is considered a significant and unavoidable impact, primarily due to the effect on the San Francisquito Bridge. Due to the cost and environmental impact associated with replacement of the San Francisquito Bridge, it is considered infeasible for Caltrain to fully mitigate this minor lowering of vertical clearance heights by replacement of the bridge.

However, if Plate H clearance can be provided at the San Francisquito Bridge through use of a OCS "neutral section", then Mitigation Measure TRA-CUMUL-3 would require track lowering and/or neutral sections (if feasible) at additional locations to allow Plate H equipment operation from San Jose to Bayshore. In this scenario, Plate H clearance would be provided from San Jose to Bayshore, similar to that available today (but not utilized) and there would not be a potential for shift of freight from rail to truck modes and this impact would be mitigated to a less than significant level.

Revisions to the Mitigation Monitoring and Reporting Program

Introduction

This document provides revisions to the Mitigation Monitoring and Reporting Program regarding Mitigation Measure TRA-CUMUL-3

Mitigation Measure TRA-CUMUL-3: As warranted, Caltrain and freight operators will partner to provide Plate H clearance as <u>feasible between San Jose and Bayshore</u> ~~the Lafayette Pedestrian Overpass location~~

Caltrain and freight operators share responsibility for the potential constraints that may occur due to the combination of a change in freight operating equipment and the installation of the OCS.

<u>Bayshore to Butterhouse Spur (MP 41.4)</u>

<u>If freight operators identify a plan to operate freight railcars along the Caltrain corridor between Bayshore and the Butterhouse Spur (MP 41.4) that would be hindered by the OCS installation compared with existing conditions, then Caltrain and freight operators shall evaluate the feasibility to provide Plate H effective vertical height clearances where needed along this segment of the Caltrain corridor.</u>

<u>The evaluation shall first include a feasibility assessment of a "neutral section", or unelectrified segment, for the San Francisquito Bridge. If the use of a "neutral section" is feasible without compromising project service improvement objectives or safety, then a combination of track lowering and "neutral sections" (if feasible) shall be used to provide Plate H clearance between Bayshore and the Butterhouse Spur (MP 41.4).</u>

<u>Based on current analysis (see Table 4-23) apart from San Francisquito Bridge, additional vertical clearance height would be required at the following locations to support Plate H equipment: Oyster Point Parkway (MP 8.60, +0.1'), Signal Bridge (MP 9.10, +0.7'), San Antonio Avenue (MP 34.0, +0.63'), Highway 85 (MP 36.5, +0.15'), Pedestrian Overpass (MP 39.40, +0.44') and Lawrence Expressway (MP 40.75, +.16').</u>

<u>If a "neutral section" is not feasible at the San Francisquito Bridge and thus the entire segment would be constrained by the low point at the San Francisquito Bridge, then no further improvements are required between Bayshore and the Butterhouse Spur.</u>

<u>Butterhouse Spur (MP 41.4) to MP 52.0</u>

If freight operators identify a plan to operate freight railcars along the Caltrain corridor between MP 52.0 and the Butterhouse Spur (MP 41.4) that would be hindered by the OCS installation compared with existing conditions, then Caltrain and freight operators shall implement site improvements to restore effective vertical height clearances where needed along the Caltrain corridor.

Based on current analysis, the only proposed improvement in addition to the Proposed Project tunnel notching/track lowering at the four San Francisco tunnels and the track lowering at Hedding Avenue (MP 46.15), San Carlos Avenue (MP 47.89), Curtner Avenue (MP 50.59), a private overpass (MP 51.08), would be track lowering at the Lafayette Pedestrian Overpass (MP 43.65).

Both Segments

Track lowering is a possible solution to rectify the reduction in clearance at constrained bridge overcrossings, but further study will be required to determine the condition of track subgrade in each specific area and to locate existing utilities that may impact the track lowering. If it is determined existing utilities are in the way of potential track lowering, the existing utilities will have to be relocated in order to achieve the desired clearance.

Caltrain and the freight operators shall apportion any cost pursuant to the existing agreement between the parties.

Presuming that any identified improvements will be implemented by an entity that is subject to CEQA, those improvements would need to be analyzed for their environmental impacts, as warranted, to determine if any additional significant impacts beyond those disclosed in this EIR for clearance improvements (e.g., those described in Chapter 2, *Project Description*). Environmental clearance shall be obtained, if necessary and required, prior to construction of any additional site improvements.

All relevant mitigation included in this EIR would apply to any additional construction necessary to implement this mitigation measure.